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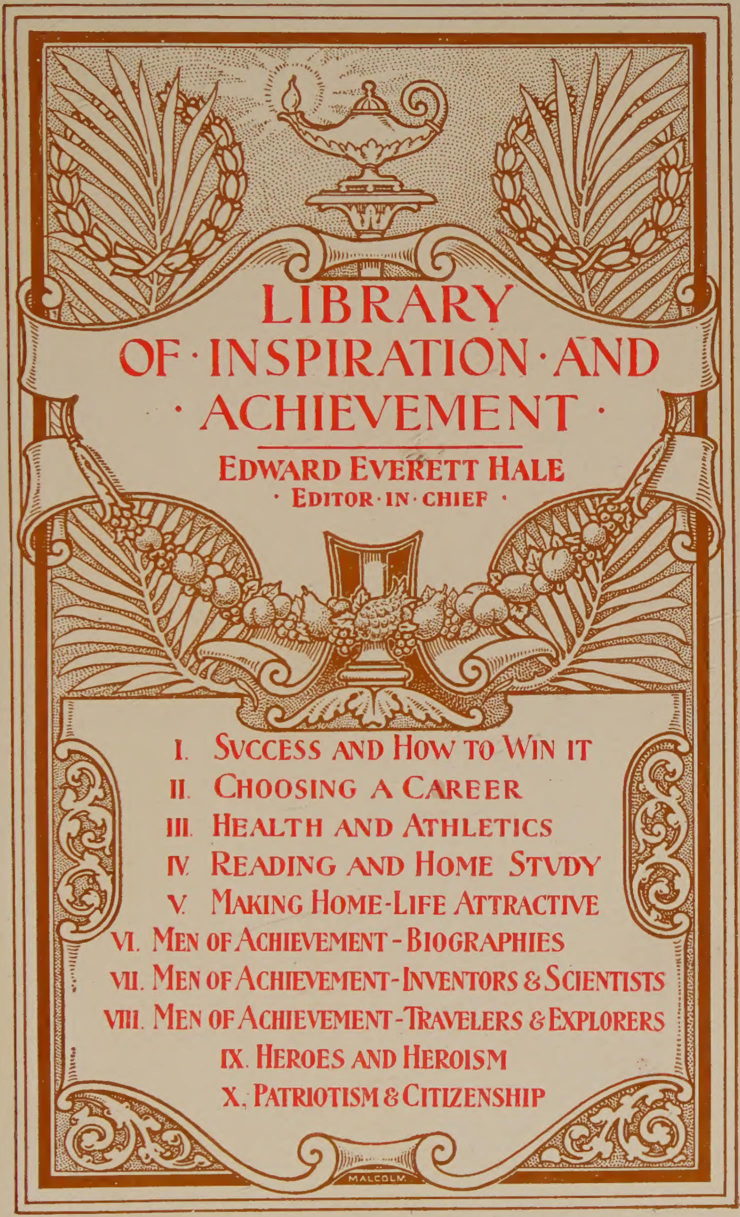

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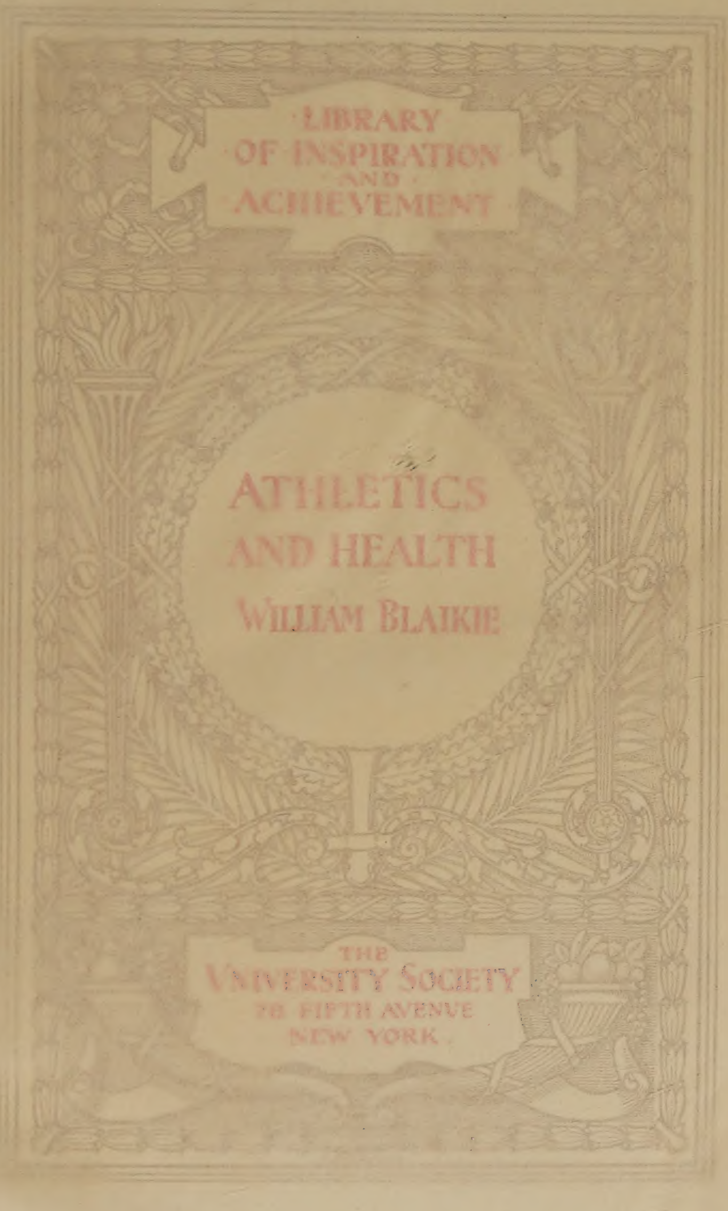

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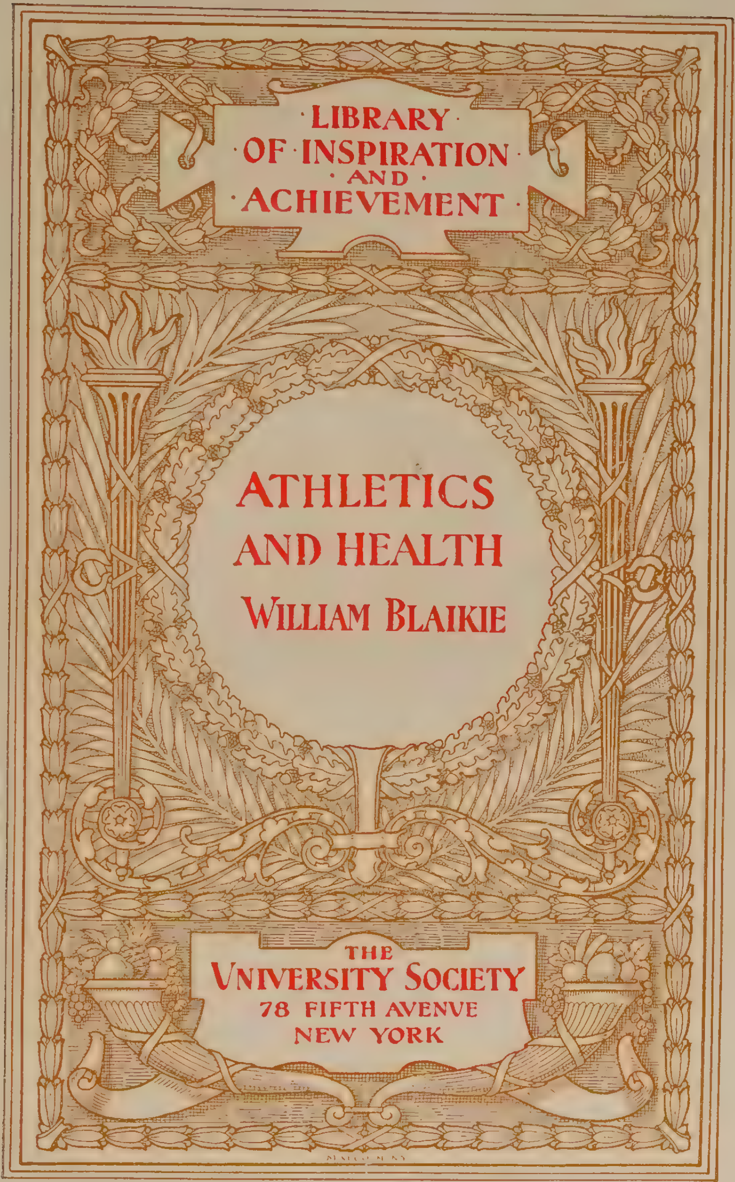

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ATHLETICS AND HEALTH

WILLIAM BLAIKIE

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INTRODUCTION

WE all want to be well and hearty. Sickness is a bitter penalty to pay for neglecting the simple rules of health. Fortunately you can recover health, or do much toward it, in a way that is full of pleasure—the pursuit of sensible sport. Sporting contests were never so popular as now.

A thousand beautiful golf fields, superb yachts, the fleetest thoroughbred horses, millions of bicycles, more good roads than we have ever had, dainty racing shells and canoes, long slender racing skates, polo, lacrosse, baseball and football fields, tennis courts, boxing, fencing, wrestling, sensible and attractive sporting suits, shoes, tools in endless variety, great gymnasiums and palatial athletic club-houses, all help to get us out and make us play. And they teach anew the truth of Solomon's maxim, that "A merry heart doeth good like a medicine."

But back of this, and more important, is the harvest it brings of sturdy, priceless health. Lay in a rich stock of that, and come what may, you are fitter to meet it. Able educators, having the best interests of our children at heart, have found the value of health, and are trying to secure it for all. In more than three hundred cities some kind of physical education is required in the schools. They have found at last that a trained head without a trained body is, as Beecher said, "Like a sword without a handle." You cannot do much with such a tool.

A boy or girl can get a better education in our land to-day than ever before. There are more schools and better ones, finer schoolhouses; larger libraries, a free one in almost every city and town; newspapers, giving the world's history of each day; periodicals and magazines, great books, dictionaries, cyclopedias, gazetteers, and atlases to refer to upon all known subjects; and an army of skilled students and writers, adding more and more to the common stock of knowledge. One has to study more and to know more to get into any of the better colleges and universities than was needed even a generation ago; or to succeed in anything else. Some years since a son of a Chief Justice of the Supreme Court of Massachusetts stated that his father, after looking over the studies needed for his son's admission to the freshman class at Harvard University, said that they were harder than those he had at graduation from there. When Daniel Webster was in college he studied little that is not taught to-day in any of the large preparatory schools.

But while you can train and store the mind more deeply and more cheaply now than ever before, a danger has also come.

A third of all our people live in towns and cities; and the number grows all the time. Children have not as many facilities for outdoor exercise as they should have. Business and office buildings used to be three or four stories high; now they are from fifteen to twenty: and so far ahead of the old ones in about everything that makes a house fit to live in, that the old do not pay, and are deserted. Residences also have made nearly as great gain. If there has been such a rapid and marked improvement in our houses, can there not be also in the bodily houses in which we live?

There not only can be, but, if many have found how to so improve and remake their bodies, and to so treat them that they do more and better work, do it more easily, and last longer, why should not all have the same advantage?

Why should not every boy and girl have such daily exercise as will make them all hearty, deep-chested, well-built, strong, enduring, erect of bearing, knowing both how to get strong and how to stay so? Able to do twice the work in life that a weak man or woman can? And why should not each be skillful in at least one kind of sport. If at West Point they can so teach a youth that, in four years, they turn him out a close-knit, seasoned, splendid man, able to tire out most men, no matter where they are put, or how poor their food, why should not all our youth have the same sensible fitting for their life's work?

Until recent years the laws of health were all but ignored by teachers of the young. Horace Mann, the famous educator, said that he knew all about the working of the heavenly bodies, but nothing about those of his own body. We are doing better now.

What other statesman in the annals of American history reached, as did President Roosevelt, at forty-two, the first place in the Republic? Would the scholar, athlete, soldier, patriot, who now graces the highest eminence, have ever made it with such a body as the average American business man has to-day? That he early realized the need of a trained body, as well as a trained mind, hear his own words: "When in Harvard I owed much to the fact that I took part in the boxing, wrestling, and running contests—though at the best I never did more than get into the finals, and I cannot overestimate what my work in big game hunting and ranching has done for me since leaving college."

When with physical development come mental power and great attainments, we have a Daniel Webster. Of him, his most intimate friend, Peter Harvey said:

"He was tall (five feet ten inches), with a chest like Hercules, a magnificent head, with beetling brows and cavernous, melancholy black eyes of the most searching and significant expression. No other human eye was ever like his." Sydney Smith well called him "a steam engine in breeches." We speak of a great man's presence. We mean his fine personal appearance or bearing. But you will seldom find a man of presence who is flat-chested. Flat chests suggest, not power, but weakness. Emerson says of him: "Here is a head and a trunk! What a front! What eyes! Atlantean shoulders, and the whole carriage heroic; with equal inward force to guide the great machine." Webster's biographer says of him: "Wherever he went men felt in the depths of their being the amazing force of his personal presence." Would they have felt anything of the sort had his grand head been mounted upon a poor, half-built body? Do we sometimes see men of unusual heads upon just such bodies, who start well and run well for a while, but break down in the middle of the life race, and are never heard of afterward? What was it that broke this body? Where? In its weakest part, just where any sensible person might have known that it would break when the real strain came. Yet this same marvel of a man did not always have any such chest. His own words were, "At nineteen I was tall, pale, slender, and all eyes."

Then somehow this slender stripling, as well as Sandow, also found a way to turn a weak chest into a mighty one. He did it by using it more than other men; by breathing slowly and more deeply. And this splendid breathing affected his whole nature. One writer says that "He was always and everywhere deliberate." A quality common with men of such a chest. Swami, a famous Hindu teacher and philosopher, says also that "deep breathing ends dullness, laziness, nervousness, and worry."

Webster was a famous sportsman, and an athlete besides. He was a hard man to whip in other ways. He had muscles, and he knew how to use them Harvey says that Webster was a capital wrestler, and often when his two sons had become men, he would challenge them to wrestle and could readily throw either of them. When party feeling ran high in the fights over Calhoun's nullification, and his friends feared personal assault upon him, his son asked why he did not arm himself as others did. He replied, "My son, I war with principles, not with men. I give no occasion for a personal assault. Besides," he added, drawing himself up to his full height, "few men would venture to assail me in the street. If one should, he would probably be put to rest for a fortnight for his temerity."

Joseph H. Choate, our ambassador at the Court of St. James, told the Chicago Bar Association the secret of professional success: "The sound body is the bottom of it all. The stomach is indeed the keynote of all professional eminence. If that goes back on you, you might as well throw up your sponge; and sleep without worriment must cherish it and nourish it all the time." But he did not tell how to keep it from going back on you; or what besides sleep is needed to make it do good work; or how to get that sound sleep.

Horace Greeley knew. He said: "The ax is the healthiest implement that man ever handled, and is especially so for habitual writers and other sedentary workers, whose shoulders it throws back, expanding their chests, and opening their lungs. If every youth and man from fifteen to fifty years old could wield an ax two hours per day, dyspepsia would vanish from the earth, and rheumatism become scarce. I am a poor chopper; yet the ax is my doctor and my delight."

If you used to be a good walker, why have you dropped it? Why do you take the nearest car, and ride as much of the way as you can? Is it odd that your legs are weak? That you cannot walk as fast, or as far, as you used to? That your legs measure less at every girth; or are fat and soft, and not to be depended on? Gladstone—a man who outworked you and bore a greater load for more years—never rode when he could walk. At seventy-seven walked sixteen miles one day, and an average of four miles, till well past eighty.

When you get in good condition, why not break away in the spring or fall, when the walking is good, and stretch across country for a fortnight or three weeks? Cambon, the French Minister at Washington, said, after coming to know the United States, that everything in Europe seemed small beside it. Why not know your own country a little, in the most delightful and profitable way you can know it—by walking through it? A fortnight in the White Mountains, a tramp in the Maine woods, or Adirondacks; up the beautiful Connecticut Valley; in Colorado; in the Carolinas or Sierras, will bring you back a new man.

Horace Greeley said: "The railroads have nearly killed pedestrianism, and I regret it. A walk of two to three hundred miles, in a calm, clear October, is one of the cheap, wholesome luxuries of life, as free to the poor as to the rich."

Professor Richards of Yale—at sixty-two a famous all-day walker—says to be sure and have rubber heels on your shoes, as they relieve the body of jar at each step, and add much to your enjoyment. With low, broad-heeled, broad-toed, broad-soled shoes—so cheap and good now—and an oak stick, you can soon walk all day, with comfort and pleasure hard to equal in any other way. You may also find your legs coming back to their old girths when you were rather proud of them.

Archibald Maclaren of the gymnasium at Oxford University, England, said in four months in the Alps, walking nine hours a day, his calves increased in girth from sixteen to seventeen and one-quarter inches, and his thighs from twenty-three inches to twenty-five. In winter get on your skates again. Go easy at first. In a few days you will be about as good as ever. One man, who had not had them on for twenty years, chanced to spend one winter near a pond, skated much, and said that he felt better for it for a whole year.

The aim and purpose of this volume is to induce every reader of its varied contents to give serious consideration to this question of health, and the mental strength which results from systematic culture of the body. The testimonies of men distinguished in many callings are here presented attractively.

Common-sense directions for recovering and increasing health are given in simple language. The special training derived from temperate indulgence in open-air games and sports is urged upon young and adult seekers for perfect health. It will be strange if any one can peruse these pages without being greatly the better for it.

Wm. Blaikie.

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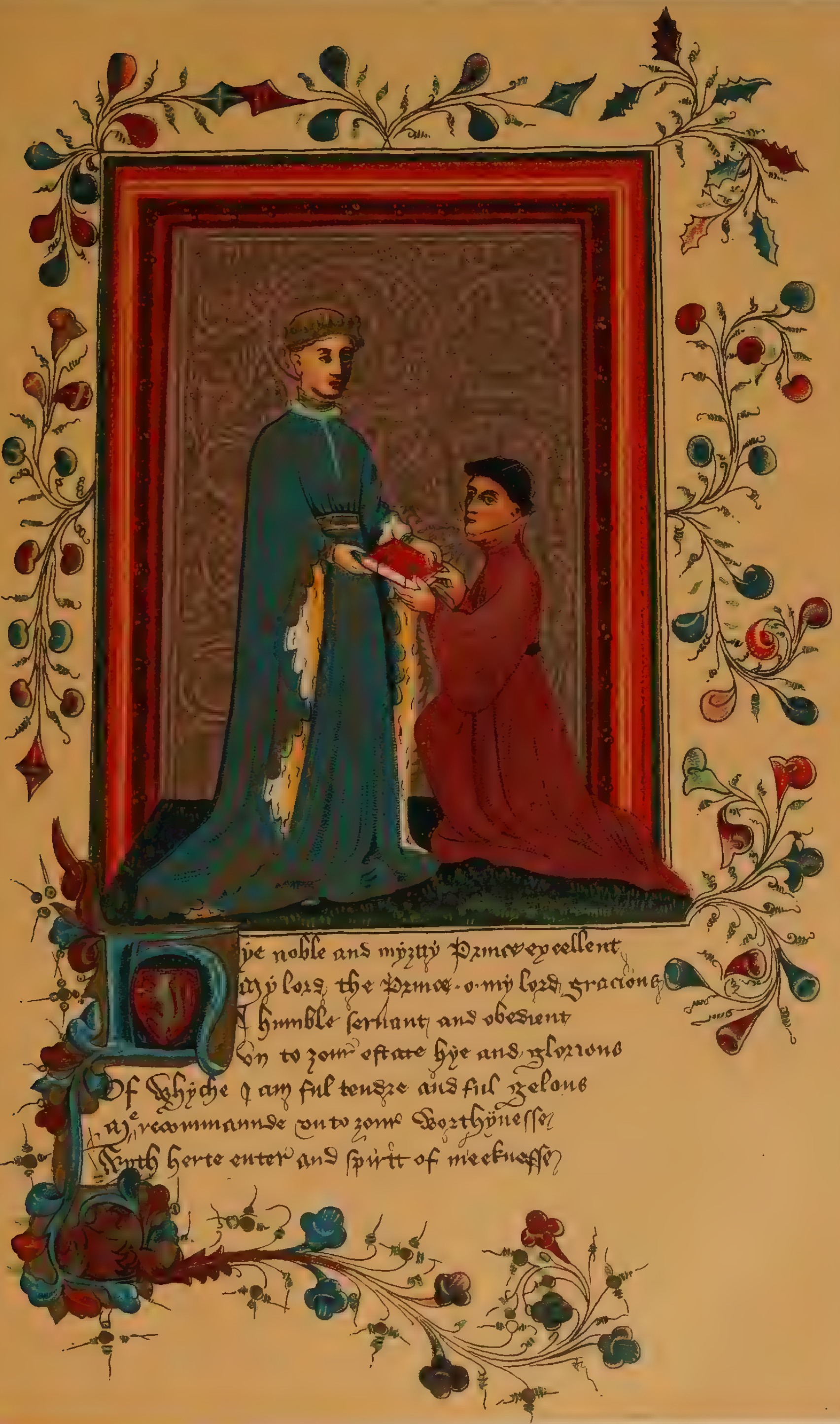
" hye noble and mygtty Prince excellent
My lord the prince o my lord graciouse
I humble seruant and obedient
Vn to youre estate hye and glorious
Of wyche I am ful tendre and ful yelous
Me recommaunde vn to youre worthynesse
Wyth herte entere and spiritt of meeknesse."

Thomas Occleve or Hoccleve was an English poet and lawyer of the time of Chaucer, living between 1370 and 1454. His chief poem is "De Regimine Principium," a new version of "The Governail of Princes." The plate is the dedication of this work to the prince of the day, afterward King Henry V. of England.



Hye noble and myȝtty Prince excellent
My lord the Prince · o · my lord gracious
I humble ſervant and obedient
Un to ȝour eſtate hye and glorious
Of whyche I am ful tendre and ful ȝelous
Me recommaunde unto ȝour worthyneſſe
With herte enter and ſpirit of meekneſſe

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KEEPING WELL

Care of the Body in Health

By ANDREW F. CURRIER, M.D.

ONE of the most effective ways of stamping out disease is to have regard for those laws and conditions by which the body may usually be kept in a state of health. No one of intelligence or experience would deny that many people come into the world with such a legacy of physical sins handed down from their ancestors, near and remote, that they are fatally handicapped, and succumb after a short struggle, sometimes hastening the issue by disregard or ignorance of their inherited weakness, and sometimes yielding after every precaution which they and their friends may have taken to rid them of the fatal incubus.

Knowledge which appertains to the ordinary care of the body in health, or while disease is yet in abeyance, is variously known as sanitary science, preventive medicine, hygiene, etc Its great importance is dawning upon the minds of the people as it did long since upon the minds of the doctors. It is not quite true, as Dr. O. W. Holmes has said, that "If all the medicine in the world were sunk in the sea it would be better for humanity and worse for fish," but it is true that, with suitable precautions, when one is well he may often avoid being sick, and consequently avoid the necessity of taking medicine.

The human machinery may be deranged and get out of order in so many ways that it would seem only the part of common sense to give a little time to the consideration of the problems which affect at least the physical well being of every one.

When Pope wrote that "The proper study of mankind is man," he must have had his physical condition, no less than his moral and intellectual in view, for he knew by personal experience what were the discomforts which attended the want of physical health.

Choice of Climate

Admitting that an individual in a fairly robust condition is in very many instances capable of habituating himself to almost any condition of climate, without seriously encroaching upon his vitality, what are the elements which must be considered by one of defective vitality in selecting for himself a place of residence?

The first requisite would seem to be that there should be no great extremes in temperature, and particularly that there should be no sudden and extensive variations. A variation of forty or fifty degrees in twenty-four hours could not fail to make an unfavorable impression upon a sensitive and delicate physical condition. The climate which at present seems to be considered most favorable for invalids from whatever cause must have a pretty uniform temperature during the greater portion of the year.

In respect to altitude, there are many places both at the sea-level, and at elevations of 1,000 to 5,000 feet, in which the variations of temperature are neither very great nor very sudden. The sea-level, or its vicinity, may be selected if the individual has dryness of the skin and mucous membranes, and a higher elevation when there is moist skin and catarrhal mucous membranes. A region which is often visited by strong winds, whether dry or moist, and whether containing irritating substances or not, should be avoided if possible. A forest region, especially of the evergreen variety, may be particularly beneficial for those who are suffering with affections of the throat and lungs.

An elevated plateau, if the winds are not strong, is also a favorable location in many instances. A location in which it is possible to have an abundant supply of sunlight, apart from the tropics or the depressing heat of summer in temperate zones, is most desirable. A climate in which the atmosphere is constantly charged with moisture is undesirable and is almost certain to intensify disease in which there is moisture of the skin, and debilitating discharges from the mucous membranes. Change of climate and removal from the familiar surroundings of home is not recommended for those who are far advanced in disease of whatever nature. However balmy the atmosphere, or exhilarating the breezes, or soothing the sunlight, it is not home, and only excites the lament of the exiled Switzer: "*Ach mein Land, meine Gebirge.*" Such a removal often hastens the final issue, and while in hopeless cases this may not be a decided objection, because of the relief to suffering which it affords, it remains a fact that with most of us, if we were allowed to choose our method of departure, there would be a preference to close our eyes to the present stage of existence in the company of those we love and who love us, and with the objects around us to which we have been accustomed, and which association has made almost a part of us.

Change of climate and of residence is for those whom disease may have attacked but not overcome, and who still have good resisting power It is astonishing how many in this category find recovery and restoration to health by migration to a climate suited to their condition, and are enabled to continue their life-work in the new environment, or in some cases to go back again with safety to their former home. A discussion of the various health resorts for various forms of disease would be too exacting upon the limits of this essay.

QUALITY OF DRINKING WATER

When we realize that from two-thirds to three-quarters of the entire weight of the body is water, that most of our food is water, and that many people are taking one or two quarts of it in an undiluted condition every day of their lives, in addition to that which is constantly taken in combination with their food, it becomes a matter of decided importance to know that it is pure and potable.

Potable water may be defined as a fluid which is reasonably free from noxious germs and from harmful ingredients of all kinds, whether in solution, in suspension, or in sediment. It should have no disagreeable taste nor offensive odor, and its attractiveness is increased when it is clear and transparent, and of sufficiently low temperature to produce an agreeable sense of coolness not only in the mouth and stomach, but throughout the entire body.

It is difficult to say which is preferable, a private or public water supply. In certain cases one or the other must be depended upon. A private supply is often impure, owing to the carelessness or ignorance of the individual. A public supply cannot long be impure and harmful without endangering the health of the community, and consequently exposing the company or corporation to the risk of litigation for heavy damages.

Water drains through porous soils or flows along the surface, taking a course which is influenced by the slope and inclination of the ground over which, or through which, it may flow. It flows in streams along the surface, or sometimes under the surface, collects in springs and pools in the course of its drainage below the surface, and is collected in cisterns and reservoirs, either natural or artificial, as it falls from the clouds.

Where there is no public supply, premises become the more valuable as they are supplied with springs and streams which become available with the minimum outlay of force and expense.

Water is a complex substance; it is never absolutely free from organic and inorganic material, or both, except when produced by the direct combination of oxygen and hydrogen, or when derived from distillation. The dissolving or solvent power of water being great, it gathers many substances in a dissolved condition as it flows along, or as it remains stationary in the location where it may have been collected. Animal and vegetable life make large contributions to the constituents of water, but the inorganic or mineral elements which are also constituents, are far more abundant. Animal sewage, decayed and decomposing vegetation, the eggs and larvæ of countless insects, the germs of numerous diseases are of such frequent occurrence in water, and are capable of doing so much mischief, that rigid tests of public water supplies are often required. Unfortunately, the test is seldom made until disease or death has awakened the community to a sense of the necessity of making it. Typhoid fever in countless cases has been communicated by drinking water contaminated with the germs of the disease. The same is equally true of intermittent or malarial fever. Cows have been seen by the author wading in a stream filled with vegetation upon which they were grazing, this stream forming the water supply of a city about two miles distant. The same stream was alleged to have been infected with sewage flowing from a large public institution nearby. This water was passed through filter beds, but it is questionable whether any filter bed is so perfect as to exclude microscopical germs. It is not strange that typhoid fever prevailed in the community which had this water supply, nor that bacteria which are peculiar to the large intestine in man and animals should be repeatedly found in water which was derived from this source. Many equally flagrant cases would doubtless be revealed, if the water supplies of other communities were carefully investigated. Is not this a sufficient proof that our public water sources cannot be too rigorously protected?

All our so-called mineral springs contain inorganic matter in solution, and in some of them the quantity is large and materially affects the quality and influence of the water. Water which contains lead, sulphur, lime, iron, magnesia, lithia, etc., is of such common occurrence that it is hardly necessary to mention it, while the water of the ocean contains not only chloride of sodium, or common salt, in abundance, but often bromine, iodine, and other minerals which are useful in some instances and harmful in others.

Water is hard or soft, according as it contains much or little inorganic matter; lime water is hard, rain water is soft. It is commonly stated that water purifies itself of impurities after flowing a certain number of miles. Such a statement is very misleading. It is doubtless true that many substances which are heavier than water are dropped or settled after flowing a greater or less distance, but there is no reason for supposing that substances which are in perfect solution, or which are of a microscopic size, are thus rendered innocuous; indeed, these are the substances from which most harm is likely to be derived. The water which contains them may be as clear as crystal, and yet it may abound in deadly poisons. It is not well to trust therefore to the appearance of water in deciding its potability and healthfulness.

FILTRATION

How may water which is of doubtful purity be rendered harmless?

It is not always easy to change one's water supply; it is always possible to render it absolutely free from harmful influences Among the methods which are in use for the artificial purification of water may be mentioned filtration, the use of chemicals, boiling, and distillation.

Water which is simply turbid, without materials which are actually injurious, a condition which is of usual occurrence after a storm or other exciting cause which disturbs the bottom over which it flows, may be rendered clear by simply allowing it to stand for a few minutes before it is used. The substances which are in suspension then sink to the bottom of the containing vessel, the clear fluid can be poured off, decanted, and the lower portion containing the sediment can be discarded.

Filtration is a very common method of treating water which is impure. Sometimes it is effective, and often it is ineffective. It consists in passing the water through a porous substance, the impurities being left behind if possible. Sometimes a porous stone, soapstone, porcelain, etc., is used; sometimes sand, charcoal, or other substances are used as percolators, the theory being that the pure water filters through and leaves the impurities behind. This may be effective for large particles; it is not effective for substances which are in solution. Besides, if the filtering material is not frequently renewed, the pressure of the water may be sufficient to force through the material which has accumulated from the first filtrations, and the filter becomes of no use whatever. Many forms of filtering apparatus are on the market; the most of them are worthless so far as furnishing protection from water impurities is concerned. A piece of coarse linen toweling wound about the water tap, and frequently changed, will catch the coarser materials as the water flows through it as effectively as the expensive forms of apparatus, most of which can do little more than this. If one is about to buy a filtering apparatus it is better to first talk the matter over with an intelligent physician or expert chemist, rather than trust to the plausible arguments of the man who has filtering apparatus to sell. In many cities filtering beds are used on a large scale, and sometimes with satisfaction.

As an example of the above, the city of Poughkeepsie, N. Y., which is on the Hudson River, has derived its water supply from that river for nearly thirty years. The tide water is of course salt, but with the outgoing tide the supply from above the city is fresh. This is pumped into beds of sand which are near the river, and then forced into a reservoir at an elevation of several hundred feet, from which, with ample force, it is distributed over the city.

The addition of certain chemicals to water which is of doubtful purity will destroy animal or vegetable germs which it may contain, and render it innocuous. One of the least objectionable substances which may be used for this purpose is dilute hydrochloric acid. A teaspoonful of this in a quart of water will slightly acidulate it and not render it unpalatable. It is better to use this than to use the stronger, more corrosive acids, which are very dangerous in the hands of the careless or ignorant.

More effective than the use of weak acids, and positively without danger, is the subjection of suspected water to a boiling temperature for half an hour. This will positively destroy all noxious germs. There are many germs which will resist a freezing temperature with ease and apparent comfort, but none have yet been found which would endure boiling. If any sediment remains after the water has been boiled, straining or filtering through a linen towel will remove it. When such water has been cooled it is by no means unpalatable and is absolutely safe. The dead taste which is the more apparent when it is not cold, may be overcome by forcing air into it with a bellows, or by hanging the vessel containing it in a draught, where it will swing back and forth and absorb air, its temperature being lowerd at the same time. Distillation is an equally efficient method of obtaining absolutely pure water, but it is more troublesome than boiling where small quantities only are desired. At the present time the distillation of water in large quantities is an important industry, and is to be commended and encouraged when the question of expense is not important. Ice which is artificially made from distilled water is far safer than the natural supply for reasons which were given.

The general conclusion in regard to a water supply, whether public or private, may be, therefore, that it should be abundant, from twenty-five to fifty gallons per day for each individual, sufficient for drinking, washing, for the use of animals, and for keeping premises surrounding one's residence sufficiently moist; that it should be pure; that it should be kept in motion as much as possible (stagnation in metallic pipes, in cisterns or in pools often contaminates it), and that it should be without offensive taste or odor.

AIR AS A TONIC

If a salubrious climate, and a suitable soil, and a proper supply of water are indispensable requisites to health, certainly not less indispensable is a sufficient volume of pure air. From the moment a human being enters the world, when the lungs expand for the first time and give expression to it in a cry, till the last gasp of physical existence, there is one imperious requirement which must ever be satisfied, the requirement for air. It matters not what the condition of the individual may be, savage or sage, saint or sinner, pauper or millionaire, air he must have or die.

Air is a mixture, four of its parts being nitrogen and one oxygen, the latter being the essential element, and being taken into the blood in connection with the process of breathing. The two gases are so loosely combined that the oxygen is easily separated from the nitrogen. Air also contains argon, watery vapor, carbonic dioxide, dust, smoke, and various other impurities. The higher we ascend, the rarer and purer the air; and the purer the air, the more the mucous membrane of the lungs is stimulated, and the faster we breathe. In cities where the air is loaded with the smoke from factories, the gases from the breaking up of various chemicals, the carbonic acid gas from the exhalation from the lungs of countless men and animals, and the effluvia from decomposing animal and vegetable waste material, it is far less wholesome than in the country where vast areas of open space permit the free movements of atmospheric currents, where the vegetation is constantly yielding oxygen and absorbing carbonic acid, and where the number of men and animals which are drawing upon the supply is far too small to make the slightest effect upon the total volume which is drawn upon, or to interfere with its purity. Unless a house or other enclosure which is occupied by men or animals is in free communication with the external air, it is far less capable of sustaining life than the external air.

In winter, many houses have a totally inadequate air supply. They are overheated from stoves or furnaces, windows are sealed, the burning of lamps, candles, and illuminating gas consumes much oxygen, and the air supply is further contaminated by the escape of deadly coal gas and the carbonic dioxide which is exhaled from the lungs of their occupants. It is not strange that for this reason much more sickness prevails in winter than in summer, and that too in a season when the cold, external air is more stimulating and bracing than at any other time in the year. There is little doubt that a large proportion of the disease which prevails during the winter season could be entirely avoided, if greater wisdom were shown in admitting to our houses a sufficient volume of pure air, the freest and most abundant of all the gifts of nature.

Air in motion is much more salubrious than air which is stagnant. We realize this in the sultry days of summer when a cool breeze or the brisk action of a fan gives an agreeable change to our feelings. We realize it too after reaching the top of a hill or mountain where we are at once exhilarated and revived by the wind and the lighter atmosphere. Moving air, even when it contains impurities, has less chance of doing harm than stagnant air.

IMPURITIES IN THE AIR

It has already been stated that the ordinary atmospheric air contains much that is unnecessary, much that is harmful to animal life. Some of the more common impurities should be well considered, for they may often be avoided or disposed of. Air which contains much watery vapor is both disagreeable and depressing in its effects upon vitality, especially when it is associated with elevated temperature. The artificial disturbance of such air with fans brings relief, and the general use of electric fans is one of the most useful applications of that beneficent force.

Probably the most common of all the impurities in the atmosphere is carbon dioxide, or carbonic acid gas as it is commonly called. This is a result of combustion, and its most common source in our houses is the exhalation from the lungs of those who occupy them. It is usually abundant in rooms in which large numbers of people are gathered, especially at night when the oxygen in the air is also consumed by the burning of lamps and illuminating gas. It produces drowsiness and inability to concentrate the mind, but this feeling is quickly recovered from when the gas is replaced by a sufficient supply of pure air.

The exhalations from the body and from the lungs of many individuals yield other gases which may be offensive, or even nauseating, to those who may be compelled to breathe the atmosphere which has been infected by them.

A far more deadly gas is the carbonic oxide, which we commonly know as coal gas, and which is the result of imperfect combustion. It is very irritating to the breathing apparatus, and is at once perceived when proceeding from a leaky stove or furnace, or one in which the fuel burns imperfectly.

Impurities in the air proceeding from decomposing animal and vegetable material of all kinds are not always directly dangerous to life, though they are often very offensive and nauseating, especially when the air space in which they are diffused is a limited one. Exhalations from sewers, privy vaults, etc., which permeate a house with defective structure or defective plumbing, are not always offensive; they may be odorless. They are probably responsible for much disease, but perhaps not for as much as is charged to them. It is for the interest of certain tradespeople and others to keep up an agitation of this kind, and particularly when, as in this case, there is a foundation of truth.

THE HEALTHY HOME

The consideration of the home from the hygienic standpoint is susceptible of a great variety of treatment, according as it is in the country or the city, isolated or united more or less closely with other buildings, massive or flimsy in its construction, costly or inexpensive. And yet there are certain conditions which ought to be satisfied, wherever and whatever the home may be. We are considering the home particularly as the abode or the place of living of human beings.

It goes without saying that the home should be built of substantial materials, having in view always the corroding effects of the elements, heat, moisture, and time. If *you* are building the home, give the contract, by all means, to a builder who has experience and character. Otherwise, and especially if he finds he has miscalculated as to his profits, you may expect he will use unseasoned timber, untempered mortar, and workmen who will bear watching. A home built under such unfavorable conditions will always be a source of vexation, expense, and dissatisfaction.

Dryness in a house is essential to health. Cellars and ground adjacent to the home should be well drained. Walls that are inclined to be moist should be dried by throwing doors and windows open, and letting in the air and sunlight; also by artificial heat if the former method is ineffective. If this does not avail, and the walls persist in being moist, abandon the house; it is unfit for residence.

AIR AND SUNLIGHT

The best houses are those which are open to the air and light on all sides. If this is impossible to obtain—and it is impossible for all in the city but a very few—try and get a home where at least the sitting-room faces east or south, and where a draught from windows in front and rear and from air shafts, if possible, will stir up the atmosphere two or three times a day and blow out impurities.

Alas! how many homes, so-called, there are in tenement-houses big and little, pretentious and unpretentious, where the blessed sunlight never comes and the air is constantly loaded with the impurities of the ages and various other things. Pure air sometimes strays in by accident, but it may be unwelcome, so accustomed do people become after a time to darkness and filth and foul odors.

Air in the Sleeping-Room

It is especially desirable that the sleeping room should communicate with the external air. Air shafts, especially in tenement houses, are often most imperfect means, either of getting rid of foul air or supplying that which is pure, and the small rooms (closets), which are so common in cities, which have neither air shafts nor windows, which may connect with a gloomy hall by a transom over the door, ought to be suppressed by law. They are hardly fit for store rooms.

To state in figures the air space which is necessary for the average human being, the cubic feet of air inhaled and carbonic acid gas exhaled, and the volume of inflowing air required to satisfy the normal respiration, would only confuse the average reader, so the matter may be condensed, by advising every one to have as large a sleeping room as he can get, with walls at least ten feet high, with a window facing the east, if possible, so that the sun may look cheerily in and bid him good morning, and let him see to it that his window is open when he goes to bed.

Ventilation

Ventilation, as applied to the home, means the removal of impure air and gases and the admission of pure air. Of course this definition is equally applicable to any and all buildings.

The air in any limited space becomes exhausted as it is used in respiration. At the same time it becomes impure and unsuitable for respiration by the addition of carbonic acid gas, which is exhaled with every expiration of the lungs. It is further contaminated by exhalations from the body, by the vapors from cooked food, by coal and sewer gas, by the combustion of lamps and illuminating gas, by dust and dirt which find an entrance into every house, and by the germs of disease. The problem is, therefore, to get rid of the impure air and to have a constant supply of fresh and pure air. Few, if any, houses are so carefully made that air cannot enter by cracks in doors and windows, and by the loose joints which have resulted from bad workmanship or shrinking materials. But this will seldom result in effective ventilation, even when the winds are high and resist all attempts to shut them out, except, of course, in the most primitive or the most dilapitated houses. In warm weather, ventilation is easily effected by keeping doors and windows open most of the time. In cold weather (except, of course, in the extreme of cold weather) let the house be freely opened morning and evening for half an hour or so, and flushed, as it were, with fresh air. In the meantime, try and arrange a draught by the stairways, or by the air-shafts and windows and doors, if one's home is on a single floor, which shall provide a continuous inflow of pure air, and an outflow of impure air. Ventilation may be provided in windows or in walls, one for the heavy gases at the bottom, and another for the lighter ones at the top of the room. Many systems of ventilation involving more or less expense have been advocated, but for private dwellings, especially when the question of expense is to be considered, an efficient system can always be devised with the exercise of ordinary common sense, by utilizing doors, windows and stairways. For public institutions, or very large buildings, some definite system of ventilation is imperative, just as one would follow a definite system of lighting and heating. In all cases, the simplest method should be followed when possible.

Heating the House

Not the least important question in the hygiene of the home is that of heating during the months when artificial heat must be afforded. In the kitchen the problem is present during all periods of the year, and is a most difficult one, the elevation of temperature in small and poorly ventilated rooms being often almost insufferable. If this excess of heat cannot be conducted to some point where it may be utilized, flues or draughts should be arranged whereby it may be conducted away. When one thinks of the enormous amount of force which is wasted by the present methods, one cannot help looking forward with great longing to the already nearly perfected methods of supplying heat in the kitchen by illuminating gas and electricity, whereby only so much heat will be used as is required to accomplish a certain amount of work. The increased comfort of those who have to work in the kitchen should in itself be a stimulus to find some method by which the excessive radiation of heat from cooking stoves may be avoided.

Various methods are in vogue for heating houses with hot air, steam, hot water, illuminating (i.e., coal) gas, electricity, etc. The subject is one which is undergoing rapid evolution, and will result in a few years, in all probability, in the general use of electricity as a means of heating houses.

Each method has its advocates and each has its good features. Hot air furnaces, if suitably mixed with pure cold air, is, if not the oldest, the most commonly used method. It is in most cases cheaper than other methods, and open to few objections which are not remediable. Hot air obtained by steam and hot water plants is merely another way of obtaining heat by radiation. Many writers, especially those who write from the standpoint of personal interest, assert the superiority of these methods of heating to that of the hot air furnace; the latter continues to be used, however, by many who are not yet convinced of its inferiority. Heating by electricity may obviate the objections to other methods, and be the chosen one of the near future.

It must be remembered that all methods of artificial heating dry, to an unwholesome degree, the atmosphere which has been heated. They also introduce into it not infrequently many objectionable elements, offensive odors, dust, coal gas, etc. The excessive dryness of the atmosphere can always be remedied by the evaporation of water in the room to which the heat is applied, and a good plan of ventilation will keep the air tolerably pure. As a matter of fact, the majority of houses which are heated artificially are unhealthful.

Disease in the temperate zone is more frequent and more fatal in the winter than in the summer months, and this is probably owing to the diminished resisting power which results from the constant breathing of vitiated air in over-heated houses.

THE PLUMBER'S WORK

The introduction of running water placed into places of residence, with the accompanying series of waste pipes leading to sewers and cesspools, has added greatly to the comfort of living. In many communities it has done away with the inconvenient and often unsanitary outhouse, it has vastly increased the use of the bath, it has diminished the labor of transporting the water supply to the various parts of a house—often a matter of great importance when the house is large and its occupants many—and in numerous other ways it has been of great benefit. It is not surprising that the blessing which has resulted has not been an unmixed one. Pipes made of lead (and plumbing means working in lead) seem to have been usually preferred for the conveyance of the water, partly for economy's sake, partly because lead is easily worked. They may also be corroded and dissolved, and not a few cases of lead poisoning are doubtless traceable to drinking water which has been contaminated by standing in pipes which have yielded more or less of their substance to it.

Very hot water is, of course, much more likely to dissolve the lead through which it passes than is cold water, and the experience of corroded pipes riddled with holes from such a cause is not an unfamiliar one. A more resisting, more durable substance for water pipes in houses, and not more expensive than lead, is desirable.

In many houses the traps in waste pipes are badly constructed. They become clogged with more or less solid material, especially with filth; they often fail to prevent the upward passage of noxious gases from sewers and cesspools, which may be the more harmful because odorless. The trap is merely an obstruction which is formed by a crooked pipe and a column of water. It is not impossible that many gases can penetrate this obstruction and not lose their power to produce mischief. It is, therefore, a very difficult matter to decide that one is sufficiently protected from such evils. The use of suitable disinfectants in traps—like chloride of lime, or chloride of iron—will be of service, but the complete remedy will come only when a more perfect system of house plumbing has been developed.

The abandonment in many houses of the systems of water pipes is a confession of weakness. Besides, even when this has been done, it has usually been done only in part, the bathroom and watercloset pipes being retained, so that if infection were present in a given house, it would still be present, even though in a minor degree, when any waste pipes at all remain.

In addition to the foregoing, there are certain general considerations which should always be regarded, if the home is to be considered as satisfying fundamental sanitary requirements. It must be kept clean and free from dust and dirt. "Cleanliness is next to godliness" in more respects than one. It should be kept from bad odors, that is, the air supply should be ample. It should not be overloaded with furniture, and particularly with curtains and hangings, which shut out air and light, and accumulate dirt, disease germs, etc. From the sanitary standpoint it would be better to do away with these things, and substitute those which can be freely washed and scrubbed, and which can harbor no elements of disease. From an æsthetic point it is to be feared that such a crusade would at least be premature. Beds and bedding must be an especial object for sanitary regulation. Iron or brass bedsteads, hard and clean hair mattresses, sheets of cotton or linen always clean, blankets also clean, and everything well aired and ventilated; these will produce sleep and promote health.

Our Clothing

Of course the first requisite of clothing is that it must be adapted to the purpose for which it is to be used: the mechanic must have coarse clothing, or overalls; the house servant must have an apron or a wrapper; children must be equipped for the various mishaps to which they are liable, and the idle butterflies, male and female, must be so robed as to attract attention and excite remark, if possible. It must also be remembered that the primary object of clothing is not to communicate heat to the body, but to furnish a barrier between the temperature of the atmosphere and the temperature of the body. The latter in health is nearly constant (98.4° F.), the former is constantly varying.

Savages, except in very cold climates, do not require clothing, the skin being toughened by exposure and becoming an efficient non-conductor of heat and cold. We wear light clothing in summer, because this prevents the passage of heat rays through it to the body. We wear dark clothes in winter, because they absorb heat rays and exclude rays of light. Furs and woolens are agreeable and suitable in cold weather, because they are excellent non-conductors. Whether one should wear cotton, woolen, silk, or linen next the skin must be settled by choice, by experience, and not infrequently by the stern conditions imposed by limited financial means. Each of these different materials has its advocates, who claim its superiority to the others.

Personal experience inclines the writer to prefer woolen undergarments, but never very heavy, for all weather except the heated months of summer. They absorb the perspiration readily, do not, when moist, give to the body the unpleasant, chilly sensation given by damp cotton undergarments, and have seemed the most efficient non-conductors, especially for great variations in the temperature.

It seems hardly necessary to say that loose clothing in summer is the more comfortable, the body moving the more freely and the radiation from the body being less impeded than by clothing which restricts and binds. In cold weather, on the other hand, snug-fitting garments prevent too free radiation of the body heat, and also prevent the access of cold currents of air which rapidly neutralize the body heat. Clothing should never be so tight as to constrict the body and interfere with the circulation. Soft hats are more salubrious than firm and stiff ones. The covering for the feet should be broad of sole, low of heel, and ample of upper. The ridiculous fashions in shoes are bringing their just penalty in deformities and diseases of the feet.

Garments which are made wholly, or in part, of rubber are almost impervious to air. Radiation of heat from the body outward is prevented, and except in cold weather, or in very wet weather, they are exceedingly uncomfortable. They are most valuable in protecting the body from rain and snow, but are unsuitable, as a rule, for any other purpose.

Occupation

It is rational and desirable that human beings, when in health, should have continuous and useful occupation. It is by no means a misfortune that for the majority of people occupation is a necessity to existence. An idle life, if not mischievous, is at least very selfish; and when we realize the brevity of life, and the great number of helpless and suffering ones who need assistance, it seems entirely inexcusable. An occupation may be the means of promoting health and longevity, or it may certainly result in disease and early death. What a pity that, in order to sustain life, so many poor mortals must engage in pursuits that inevitably bring their life to a premature close. Out-of-door occupations, even if laborious, are not usually unhealthful; farmers, mechanics, teamsters, sailors, if they observe ordinary precautions, are wont to enjoy rugged health. On the other hand, those who work indoors are more susceptible to disease; hence, factory hands, tradesmen, even professional people, unless their indoor life is compensated by sufficient out-of-door exercise, are deficient in physical endurance.

Muscular exercise and an abundance of fresh air seem to be the principal factors in determining physical well being. For those whose life must be passed indoors to a large degree, it is therefore desirable that physical exercise should be constantly cultivated. It may consist in walking, riding, rowing, athletic games, gymnasium exercise, or a variety of other useful measures. Unless something of this kind is systematically pursued, it will be very difficult to maintain uninterrupted good health.

The daily bathing of the entire body is especially useful for indoor workers. The skin disposes of much of the waste material of the body. Those who are constantly engaged in out-of-door work usually find that the skin readily responds to the task which is imposed upon it, and the general activity of the organism also encourages easy performance of function of the other excretory organs, the lungs, kidneys, and intestines. The indoor worker is often deprived of this constant stimulus, and the daily bath will be of assistance in keeping the skin in condition to perform its necessary work. Its temperature must be largely a matter of choice. The indiscriminate use of cold baths is neither wise nor satisfactory.

Recreation

Amusements, aside from physical exercise, are not to be neglected; music, the drama (when it is clean and instructive, which unfortunately is often not the case at the present time), interesting or amusing lectures, various indoor games, and many other forms of wholesome recreation are useful adjuncts in the consideration of the means for promoting health.

Occasional vacations have a most important sanitary value. No one who has followed the development of the movement for giving brief periods of rest during the summer, whether by the seashore, at the mountains, or in the country, to our tired and sick men, women, and children of the city, our brethren and sisters, especially to the poor, and those whose homes are not very bright or cheerful, can fail to realize what this means, even from the physical standpoint. If the employers and capitalists were to look at this matter only from its economic standpoint, divesting it of its sentimental side if they chose, they would find that they would realize large returns for all investments which they might make in country homes and vacations for their employees. An occasional change of scene, a brief respite from work, and an opportunity to develop acquaintance with the beautiful things in this beautiful world in which we happen to be staying for the present, is a tonic which I would like to prescribe for every tired worker in whatever field.

One of the most imperative requirements for health is sleep and an abundance of it. In some cases, and in certain conditions, it is more essential than food. We can learn useful lessons in this direction from the animals. A sick cat or dog refuses food, goes into an out-of-the-way place, curls himself up, and sleeps perhaps twenty-four hours or more, and when he awakes it often happens that his sickness has disappeared.

Children with rapidly changing, ever-developing tissues, need many hours of sleep—ten or twelve daily. Those whose lives are active, with whom there is great muscular exertion every day, those who are worried and harassed with care or sorrow, those who are strained and weakened with pain, realize, more than others, the inestimable boon and blessing of sleep.

> " Sleep that knits up the ravel'd sleeve of care,
>
> . . . .
>
> Balm of hurt minds, great nature's second course,
> Chief nourisher in life's feast."

It is often said that the antidote for physical fatigue is change of occupation, mental employment, or a change of mental employment furnishing occupation for another set of faculties while the tired ones are resting. This may be applicable to some people, but the writer has observed very few of them.

It is useless to improve upon this elixir of sleep, and it will usually be found an unprofitable undertaking to try and cheat nature out of her dues in this regard by any subterfuges or substitutes. Seven to nine hours of quiet sleep out of each twenty-four for adults in good physical condition will give good equipment for the recurring struggles and labors which each day may bring.

It would seem probable, *a priori*, that the aged, with enfeebled powers of mind and body, would require more sleep than those whose powers are active and vigorous. This may be so in many, perhaps in the majority of instances. A lethargic, inactive condition in the aged is common, from which the transition to sleep is easy and natural. It very often happens, however, that aged people do not require so many hours of continuous sleep as those who are younger, three or four or five hours at night sufficing, with perhaps an hour or two during the day. It would be an interesting subject to speculate about, and could be explained on physiological grounds.

DIET

Equal in importance with almost any of the questions which have been discussed in connection with personal hygiene is that of diet. The question for civilized man not only is, How much shall I eat? but, What shall I eat? and physiology and chemistry have been giving very exhaustive answers during many years of investigation. We are not considering the man who eats everything within his reach which is eatable, or which he assumes to be eatable, but the one who has a certain amount of intelligence, and who realizes that some articles of diet may be more useful to him than others.

It seems hardly necessary to say that infants and young children are not provided with organs to digest the same or the same quantity of food as adults, and when they are fed from the common family table, as is often the case among the poor and ignorant, it is not strange that only the fittest survive. It would be startling if the facts were known as to the thousands of children who are annually killed by improper food. Food for the young is, therefore, not necessarily appropriate for the mature, and vice versa.

The fundamental object of food is the production of heat and vital force, and it is quite analogous to the production of heat and force in an engine by means of fuel. Food is not required to the same extent in summer as in winter. In a cold climate the activities of the body are greater than in a warm one, more heat is required and is developed, and hence more food is necessary. It is also necessary to select for cold weather those varieties of food which have great heat-producing capacity, and which would be quite inappropriate for warm weather. Hence diet must be modified by climate as well as by age. The work which one must do should modify the diet; the lumberman, the sailor, the miner require different food and more of it than the shopkeeper, the clerk, the teacher, or the lawyer. Both the quantity and the quality of the food must also be regulated by the physical condition in a given case. A robust person requires more food than a sick one, and he can eat, without fear of harm or indigestion, many forms of food which the stomach of the sick person would be unable to digest or would reject promptly.

Many series of physiological experiments have been made, both upon man and animals, to determine the most useful substances which may be employed as food, and it has been definitely determined in the case of a large number of substances, just how much can be expected in the way of useful results when they are used for food.

We learned in the chapter on physiology that the stomach digests only albuminoid substances (lean meat, eggs, milk, and certain portions of the cereals), and that the intestines, aided by the liver and pancreas, digest only the hydrocarbons (oils, fats, butter, potatoes, rice, and the greater portion of many of the vegetables); therefore, while it might be possible for a person to live upon food which was digested only by the stomach, or only by the intestines, at least for some time, it would be, to say the least, an unfair distribution of work to impose all upon the stomach, or all upon the intestines. The obvious conclusion would be that a diet should be composed of both albuminoids and hydrocarbons, and this conclusion is fully borne out as the result of physiological experiments. That is to say, a mixed diet, meat, eggs, milk, and vegetables of different kinds, is not only the most rational, but the one which is best adapted to secure health and the highest results in the direction of physical and mental work.

It may be interesting at this point to consider briefly the nutritive value of some of the substances which are commonly used for food. Of these substances milk is first in importance, for it is not only a product which is derived from all mammals, but it is a universal article of food with the entire human race. It is the typical food substance, because it contains water, which is the most essential element in the body; caseine (cheese), which is the albuminoid element, and fat (butter) and sugar, which are the hydrocarbons. These essential elements are always found in milk, no matter whether it be obtained from human beings or from any other variety of mammals.

Wheat is perhaps next in importance to milk, and has often been termed, in the form of bread, "the staff of life." It contains albumen, starch, and mineral substances, and is therefore perfectly adapted to sustain life. One could live indefinitely on bread and water, even though such a diet might be very monotonous.

Eggs form an important portion of human food, but they consist largely of albumen, and, therefore, are not suited exclusively for a substance of food. They are important and almost indispensable as an *element* in diet. It should be remembered that eggs cooked are more difficult to digest than eggs uncooked. The error is often made of giving cooked eggs to the sick, or to those who are beginning to convalesce from severe illness. At such a time the gastric juice is deficient in quality and quantity, as a rule, and is unable to attack this concentrated mass of albumen successfully. Hence it must not cause surprise if it is brought up again in a hard lump, or after causing abundant pain, passes downward and is finally expelled from the lower end of the alimentary canal, still practically undigested.

Meat, or muscular tissue (and this includes the muscular tissue of fish), is quite essential as an article of diet. It is not indispensable, for many human beings do not use it and thrive without it. Lean meat is classed among the albuminoids; animal fat is, of course, a hydrocarbon. The digestibility of different kinds of meat varies greatly. Beef, mutton, and the white meat of fowls are the most readily digested and assimilated. Pork, the dark meat of fowls, game, and fish are less readily digested. Soups, when prepared from both fat and lean meats, are naturally less easily digested than those which are made from lean meat alone.

The cereals, oats, rye, barley, corn, etc., have a very important value. They consist largely of starchy material (hydrocarbons), but also have a certain percentage—varying in different specimens and different grains—of vegetable albumen, so that they have the possibility of forming the principal portion of the nutriment of large portions of the human race.

Rice and potatoes consist very largely of starch. The former is the principal article of diet of the majority of human beings, and its results in vital force, especially among the myriads in China, India, and the tropics, are indeed remarkable. Probably climate and race act as very important factors in determining these results, however. In Ireland and in South American countries in which the potato is indigenous, this substance, though almost exclusively starch, constitutes the bulk of the food. The results, especially in Ireland, often show the disadvantages of so exclusive a diet. Peas and beans contain a large portion of starch, but they also contain considerable vegetable albumen, which gives them great value as food. The nutritive value of some of the fruits and nuts (for example, cocoanuts and bananas), though they consist mostly of starch and sugar, is very great. Many other fruits and vegetables consist very largely of water with some starch, fat, sugar, and very palatable vegetable acids. They give variety to the diet, are often mildly laxative to the bowels, and therefore play a very prominent part in the mixed diet. The fruit of the olive tree is a conspicuous example of the great utility of a vegetable product.

TEA, COFFEE, AND THEIR SUBSTITUTES

The value of tea and coffee, so far as their active principle (theine, caffeine) is concerned, is alike for each, since the molecular construction of each is the same. Tea contains tannic acid, which gives it its astringent property, and explains the constipation which is so common with those who take much of it, especially if it is taken in very strong or concentrated infusion. Tea is a leaf, coffee is a berry or fruit; and the latter contains more starch, which is an essential product of all growing plants, than does the former.

The value of tea and coffee is due largely to the heat of the water with which they are usually taken in the form of an infusion. The starch value—that is, the nutritive value—is very small, but the influence of the active principle (theine, caffeine) as a stimulant to the heart and the nervous system is very great. When one is cold and wet, or weary with severe exertion, a cup of hot tea or coffee, with its generous warmth and its whipping on of exhausted nerve centers, banishes bad feelings for the time and revives drooping energies.

It is not usually desirable to give such substances to children. The depression which comes from fatigue and exposure is quickly rallied from, if only they can be warmed and dried, and the surface of the body actively rubbed for a few minutes. The use of tea and coffee by children, unless in a very dilute form, over-stimulates the sensitive nervous system, and will comparatively seldom be found necessary.

ALCOHOL AND TOBACCO

A great deal might be said in this connection in regard to alcohol, but the object of the book is not controversial, and space is wanting to give fair show to both sides of the question. Nobody doubts the enormous injury to the human race from the use of alcohol. Whether it is food or not, does not concern us now. That it is a poison, no one who knows anything about the subject will deny. But we are constantly using poisons, and often become entirely habituated to their use, without apparent harm either immediate or remote. This practice will probably continue to the end of time, for nothing has as yet been discovered or conceived of which would act as a substitute for many of the poisons which are in use. The great thing is to use them with intelligence, and when they are required. In connection with individual hygiene it is proper to say that tippling, that is, frequent drinking of alcohol in any form, merely for the sake of drinking, or for its so-called encouragement of sociability, is unnecessary, expensive, and ought to be discouraged. Every physician of experience knows that there are constantly recurring instances when the prompt use, or the continued use, of alcohol in a suitable form may save and prolong life, but one does not usually resort to a liquor saloon to procure the alcohol for such purposes.

Much the same line of reasoning that has been used in regard to alcohol would also apply to tobacco, looking at it from the hygienic standpoint. Tobacco, however, is a narcotic, while alcohol is a stimulant; the former soothes or depresses the latter stimulates. With many, especially those whose work keeps them out of doors most of the time, tobacco seems to have no bad influence, and they may even smoke the rankest and vilest of pipes, and the coarsest and strongest tobacco, without apparent harm, and with very decided manifestations of enjoyment. The effect of tobacco as a poison is to weaken the heart action. Collapse attends its poisonous effect, with nausea and purging. Who that has had a struggle in trying to master its discomforts does not remember the gruesome feelings, the unhappiness, and the resolve to let it alone in the future which have accompanied the undertaking; and how many are there who have not courageously renewed the attack, forgetful alike of past suffering and good resolutions, until the enemy was conquered?

It is difficult to define moderation in the use of tobacco. The term is wholly a relative one, depending upon the physical condition of the individual, his occupation, the quality of the tobacco, etc. The use of cigarettes in such excessive quantities as obtains with foolish persons, and especially with the young and immature, is reprehensible. The evil effects of such habits, and the immoderate use of many good things, upon many young men, are too obvious to call for any argument or any possible consideration in their favor. On the other hand, a cigarette of honest tobacco, untampered with by reckless manipulators, is lighter and safer to smoke than the average cigar, and also has advantages over the pipe.

Importance of Cooking

Not only the palatability, but to a large degree the usefulness, of food depends upon the care which is exercised in its preparation. Certain kinds of food require no preparation, but are palatable and nutritious as provided by bountiful nature. Many of the fruits, and not a few vegetables, may be included in this category. Other vegetables, cereals, etc., must be ground, baked, boiled, fried, or otherwise subjected to the action of heat before they become suitable or attractive for food. This operation in which the action of heat is invoked, which we call cooking, is a most important one. It develops certain odors or flavors which are agreeable both to the sense of smell and that of taste, making the food more palatable and in many cases more digestible; it coagulates albuminous material, and with some substances it produces chemical changes which promote their nutritive value.

Of particular importance is it that animal tissue should be submitted to heat before it is used as food. Certain very troublesome parasites are found in the muscles of animals (for example, trichinæ in swine), and the habit of eating this tissue uncooked has led to countless cases of disease, every one of which could have been avoided had the meat always been cooked. Oysters and clams are also not infrequently the bearers of disease germs, and the friend who places them in tempting array before us may little realize the danger to which he is exposing us, or possibly the disaster which he unwittingly invokes.

Condiments and relishes are often useful in giving piquancy to the taste of food, and often assist digestion by their stimulation of the gastric mucous membrane.

The effect of salt, pepper, mustard, cloves, allspice, etc., is too well known to require comment. Gravies and sauces in which fat and grease form the principal element are not usually to be commended. If the digestive function is weak, they will usually add an unnecessary burden to it.

Care of the Teeth

The best way to treat disease is to avoid those habits and methods and substances which produce it. Equally pithy and equally true is somebody's remark that to cure a certain disease in a certain family, he should have been allowed to go backward and begin with the grandparents. That is, we are now realizing the importance of preventive medicine. In this important science which concerns everybody we should know something of the nutritive importance of the materials from which we select our diet; we should also determine by experiment those substances which are helpful to us, and those which are hurtful. The care of the teeth and mouth in this connection is not to be neglected.

Sores in the mouth must be cleansed with frequent washings, with weak solutions of boric acid (teaspoonful in a glass of water), carbolic acid (one part to one hundred of water), or bicarbonate of soda (teaspoonful in a glass of water).

The teeth should be brushed with a stiff brush night and morning, with or without the use of a dentifrice (powdered chalk with myrrh added). Food should not be allowed to collect between the teeth, a quill toothpick being used to remove it. The dentist should be visited sufficiently often to keep decayed teeth under control, and to secure the removal of those which are beyond repair. One can scarcely realize the harm to the digestive apparatus from decayed teeth and sores in the mouth. Offensive breath from this cause, or from any other, should be investigated and removed, not only because it is an evidence of injury and ill-health, but because it gives discomfort to others.

Disinfection

If the statements in the preceding chapter are true, this section upon hygiene would not be complete without some reference to the various methods of disposing of the germs of disease which have been liberated in the atmosphere, absorbed by water, and which have settled upon the walls of houses, upon articles of furniture, clothing, etc.

Many of these germs are exceedingly tenacious of life; they may remain inactive a long time, even though they do not develop and grow. Some of them will live even in a medium which is without air, but the most of them, it is believed, require air like other forms of life. Some of them bear a temperature below the freezing point without discomfort and are often found in ice; none of them will endure a temperature above the boiling point for any length of time. Most of them will succumb to powerful chemicals like sulphur, chlorine, mercury, and formaline.

Food which is thoroughly baked or boiled is not a source of trouble from disease germs, but it does not interfere with the work of germs which are already in the alimentary canal, and their treatment can hardly be undertaken until they have manifested their presence by some disturbance in the individual affected. Raw food is always taken with risk; it may be disinfected with chemicals, but this is usually inconvenient. It may be thoroughly disinfected with heat—that is, by cooking. Water, which is boiled or distilled, is free from germs; also artificial ice, which is made from distilled water. Five or ten drops of dilute hydrochloric acid in a glass of water will sterilize it sufficiently, and the acidulous taste of the water will not be objectionable to most people.

Milk is so important an article of food and so often a source of disease from the bacteria which it contains, that a few words concerning its disinfection or sterilization are demanded. Prolonged boiling of milk destroys its germs, but it also coagulates its caseine, and makes it more difficult to digest. There are several excellent forms of apparatus on the market (Soxhlet, Seibert, and others) for sterilizing milk when used as food for infants, which may be adopted with safety.

Pasteurization of milk consists in subjecting it to heat from 158° to 176° F. for half an hour or longer, and then rapidly cooling it to 54° F. or less. This will destroy, or render inactive, the bacteria which it may contain, but will not coagulate the caseine.

Those who, as nurses, doctors, or assistants, have attended the sick with the eruptive diseases—measles, scarlet fever, smallpox, whooping cough, diphtheria—or even tuberculosis and typhoid fever, and in general any form of sore or injury which is accompanied by suppuration and blood poisoning, should wear special clothing for that purpose, which should be worn nowhere else, at least not until it has been boiled, washed, and ironed.

Books, clothing, and the various small articles in the sick-room which have been exposed to infectious disease, may be baked at a temperature equal to the boiling point of water; but as this is not always easy, and involves the risk of destroying that which is put in the oven for the purpose, the better way may be to subject the infected material to the action of chemical vapors.

All the efficient chemical disinfectants are irrespirable in the state of vapor, and hence the disinfection must be effected in a closed room which is unoccupied at that time. Chlorine is a valuable disinfectant, but it also removes the colors of substances which it attacks.

Formaline has recently been introduced, and has been found very effective as a disinfecting agent. It does not injure nor decolorize substances. There are various lamps on the market which are used for liberating this gas from wood alcohol. There are also metallic boxes, not very expensive, in which a large number of articles can be placed and then disinfected with formaline vapor.

Those who attend the sick, not less than the sick, should disinfect themselves after exposure. Alcohol is one of the best disinfectants, and the daily sponge bath for the entire body of one who has an infectious disease is both agreeable and useful. If the skin peels or scales, the sponge bath should be followed by inunction with fresh (that is not rancid, this being important) cocoanut oil, which will not only soften the skin, but prevent the loosening and flying of scales.

For those who attend the sick the daily bath should be a custom. If the disease is infectious, an antiseptic soap (formaline, mercury, or even plain castile) should be freely used, and especially upon the hair, the hands, and the nails. The latter should be kept closely pared, rigorously clean, and a stiff brush used frequently to the spaces around the nails. Dirty hands, finger nails, and instruments are responsible for much of the disease which ought never to occur.

A room which has been occupied by a person with an infectious disease should in no instance be used again until everything in it, and better still, everything in the house, has been disinfected. In most of our cities the board of health will attend to such matters, but in villages and in the country, it must be done by individuals. Carpets and curtains, also all bed coverings and mattresses, must be steamed for an hour or longer until every inch of surface has been thoroughly permeated. Inexpensive articles of furniture, especially when old and dilapidated, also straw beds, old coverings, etc., should be destroyed by fire. Walls, ceilings and floors may then be scrubbed, if they will admit of such treatment, with hot bi-chloride of mercury solution (one of mercury to one thousand of water). Windows and doors must then be closed and formaline vapors liberated into the room for an hour. This method is preferable to burning sulphur in the room; it is more effective and the odor is less persistent. The room should remain closed for twenty-four hours; it may then be opened and aired and used again with safety.

The proper rule to follow in these days, when we know the terrible possibilities from the spreading of infectious disease, is to take all necessary precautions which are available, resting reasonably assured that if we do, the disease cannot be extended through fault of ours. There is little excuse for ignorance in such matters; in fact, ignorance becomes a crime, for it need not exist.

HEALTH–EXERCISE

Common Sense Physical Training

By WILLIAM BLAIKIE

IN the last twenty-five years—thanks largely to the Training School for Christian Workers, at Springfield (Mass.)—there have come up men who, besides being your best friend if you want to excel in sports, know how to build up a poor body, a flat chest, slim legs, pipestem arms, and a small neck; so that in a few years they can turn you out, well built in every part, erect of bearing, shapely and enduring. They also know what a well-built boy or girl, man or woman, of any height ought to weigh; how large they should be in each girth of body or limb; and just what to do to bring them up to that mark; and what they should be able to do in any sort of athletic contest.

Strengthening Weak Constitutions

They do more. They take the deformed—even those born weak, or with organic defect—and by and by turn them out stronger than the average man, and they do this without much professional training. One school in England makes this its specialty. A few hours' daily work has in two years built up the weak and broken down, the wornout through overwork or reckless dieting, into ruddy, hearty men and women, buoyant with strength and splendid vigor, in a way bordering on the wonderful.

Ella Wheeler Wilcox says: "I have met and talked with a hale, hearty woman, whose family all died of consumption, and who was herself expected to die in her 'teens.' She resolved to live, however, and to breathe. She devoted herself three times a day to deep breathing for half an hour in the open air. At first it caused violent coughing spells, but they grew less frequent as she persisted. She lived out of doors as much as possible, and slept in a well-ventilated room. She practiced gentle calisthenics, increasing their force as she gained in strength, and night and day she *thought* health for herself. She realized her expectation, married, and was the mother of strong children, whom she brought up from infancy to breathe and exercise properly, to live out of doors, and to bathe in cold water."

Nor is this a new thing; any physical director can point to cases like it among his own pupils. It is so common among them to build up a half-built boy, girl, man, or woman, that they find it no harder than it would be to make a fairly bright pupil master French or Latin; or for a good builder to finish a half-built house; or for a wagon-maker to repair a broken-down wagon.

Strangely enough they can point to a famous proof of what can be done in training a boy, not strong, into perhaps the strongest man of his height and weight in all the world to-day; one of the strongest it has ever known.

A jeweler's son, naturally delicate, not a strong boy when at school, Sandow has little by little, by sensible daily exercise, built himself into a giant, able to pick up an ordinary man with one hand, to throw him over his head, and to do many other feats which seem beyond human power. He is stronger than one man needs to be. But he has shown that one can make himself about what he will. John C. Calhoun said that when at Yale College, he had by rigid determination so disciplined his mind that, no matter where he was, how exciting and distracting the surroundings, or how tired his body, he could make his mind his willing servant as long as he liked. How many men do you or I know who can do that?

And when can we think more effectively—when weak and underfed, and sending weak, underfed blood to the brain, or when keeping it amply supplied with rich, nourishing life blood? When the brain is busy, it needs more blood. Beecher found that in an hour's oration his neck gained half an inch in girth, and that it took about an hour to return to normal size.

The Value of Staying Power

This ability to endure, where others break down on the way, marks the difference between the winner and the loser in nearly every important work in life. It accounts for the success of country-bred boys like Commodore Vanderbilt, Daniel Drew, Peter Cooper, and Russell Sage, in the excessive strain of managing large interests in the city life, where city-bred boys had not the constitution to stand the pace. It is absolutely essential to vast undertakings. "For performance of great mark," says Emerson, "it requires extraordinary health." In the Civil War, general after general had to give up the lead. Though they had countless wealth and vast armies ready at hand, somehow they failed. But an Ohio country boy, trained at West Point Military Academy—its best jumper on horseback, by the way—started with victory, and followed with victory upon victory, often against obstacles that others called insurmountable, until he won, proving himself one of the greatest captains of modern times; till it was well said of him, "I know no such unquestionable badge and ensign of a sovereign mind as that tenacity of purpose which, through all changes of companions, or parties, or fortunes, changes never, abates no jot of heart or hope, but wearies out opposition, and arrives at its port."

A strong man learns to take defeat lightly, to know that most victories have only come after more than one defeat which would have crushed a feebler will. He learns to laugh at defeat; to get right up, Washington-like, Bismarck-like, and fight on; and that each obstacle is, to a sturdy nature, but a rung in the ladder which leads to the top. To live in our land, at least in its cities or towns, we need this health and stamina.

Thackeray on American Air

Thackeray said that our very air is more exciting than that of England; that "There is some electric influence in air and sun here which we don't experience on our side of the globe; people can't sit still; can't ruminate over their dinners; dawdle in their studies; they must keep moving; I want to dash into the street now. At home, after breakfast, I wanted to read my paper leisurely, and then get to my books and work. Yesterday, as some rain began to fall, I felt a leaden cap taken off my brain-pan, and began to speak calmly and reasonably, and not to wish to quit my place." The British athletes who visit us to-day say the same thing of our air.

It is common talk in Wall Street that a partner of one of the greatest financiers the world has ever known owes his place largely to his fine looks and bearing. That same fortunate man was in youth a member of his university crew—one of the picked men out of thousands to represent his university in the great annual water struggle for supremacy. A man of body not neglected, but trained, educated to self-denial, plain living, hard work; to obeying orders, and to facing the best men of the rival university, in a struggle that, in twenty minutes will so use up the strongest man that he can scarcely stand or see.

What other boy would not a trained body be apt to serve, perhaps not as well, but at the turning point in his life? Are there many more attractive things in the world to-day than a really fine looking man or woman? Do not their looks often have much to do with marrying them—and ought they not to?

If the boy is to be a mechanic, perhaps a mason, blacksmith, or machinist, or a worker in some other line where he must do from eight to ten hours a day of severe bodily labor, which will likely be equal to his task, a weak youth or a strong one? The work is really too hard for the weak one: he is not fit for it. But the strong fellow, he of sturdy body and brawny arms, plays with the same tools that wore the other out, and at evening does not know what tired means.

Safe, Simple, and Cheap Exercise

Happily, too, all the exercise one needs to be strong instead of weak, is simple, easy to do, takes hardly one hour of the twenty-four, costs nothing, and can be done almost anywhere.

It has no bound or limit. No man knows all the ways to exercise the body. New ones are being found all the time. And each one fits you to do a little better some kind of work or play.

Do you want, for instance, to know how to be erect of carriage? To walk up as straight as the straightest man you know? Well, the walls of the room you are in are vertical. Now stand with your back against the wall; press your heels, the back of your knees, the small of your back, and the back of your neck, as hard against the wall as you can. The small of your back will not touch it, but it will come nearer to it than usual. You are as straight now as the wall itself. Stand there against it in that way for only three minutes. Somehow you have suddenly become straight. The poke-neck of most men has gone; your head is now on top of your spine, exactly where it belongs. Your chest has expanded, your legs have straightened, and you feel the various straps and muscles all over your body gently pulling you into position, until you wonder how you could have so long gone out of true. While so standing there, do another thing. Take a full, deep breath—as so many have taken who meant to get rid of consumption: set about it, used sensible means, stuck to it, and did it. See how your chest rises; how it expands forward, sideways—in every diameter; how it lifts up in front nearer to your chin than you ever saw it before, or thought it could: and the more you heave your chest the better. And what has this chest-expanding done? Let a man, who has, by simple daily breathing and other exercises, built up a feeble and emaciated body so well that to-day he is a noble personal presence, tell you. Dr. Charles Wesley Emerson, of Boston, says that "The greater the altitude of the vital organs, other things being equal, the greater is their vigor. The heart beats with a more perfect rhythm when lifted high in the chest than when it is low. When the vital organs are high, the lungs consume more air, the stomach properly secretes gastric juice; the liver secretes bile from the blood; the alimentary canal is healthy in the production of what is called the peristaltic waves. The moment these vital organs are lowered from their normal altitude, the air tone of power is lowered. There is no physical defect so general as this—that the vital organs are from one to four inches too low among adults, and among children down to the age of five or six years. Before this time the vital organs are high." Why should not every boy and girl in America practice this slow, deep breathing every day; and this erect carriage that keeps the chest high up toward the chin all the time?

Is it not as important to any man or woman to so largely increase his or her power in every way, as it is to be a little farther on in arithmetic, or geometry, or any of the other studies taught in our schools? What other studies add so much real power as this? Hardly a letter of Washington's but shows that he was a poor speller. But what man has this or any other speaking land produced who was so truly great? He, too, by the way, was but half an inch smaller around the chest than Webster, and was one of the greatest amateur athletes America has ever known. Is it not about time that a branch so simple, so cheap, costing not one cent, so potent for good in about every direction, should be taught to all our boys and girls? And it may be taught in the schoolroom, by the same teacher who hears them in their other studies.

How to Sit Correctly

If they insist that every cadet in West Point shall sit erect always while at recitation, until it becomes a habit, and they do it without thinking of it, why not establish that same habit in every schoolroom in America? Any teacher worthy of the name, any up-to-date teacher, can soon learn how to teach this. Let the teacher insist that pupils, at all times, sit far back on the seat and hold the chin well drawn in toward the neck. The more you draw it in, the more you enlarge your chest. At first it will tire a few muscles a little. But that is of no account. Make the fight, and never give up till you win. No matter how many times you forget or fail, do it again and again, until you find—as you will find in a few days—that it is just as easy for you, as it is for a West Pointer, always to hold yourself erect, while sitting or standing; you thus keep your vital-house in such a posture that every vital organ has full room to do good work, as it has not when you stoop.

The children practicing it in unison, and finding soon how much better they feel and look for it, will learn it almost in one lesson. Then, by calling their attention to it at the opening of each day, starting them right, seeing that each sits far back on the seat, so making an erect position easier than any other, and, for a minute or two between recitations, calling upon them to see how high they can hold their chests and how full they can fill them, the lesson will be learned practically at sight. It also will show the teacher the wisdom of supplying the room, all the time, with fresh, pure air, in the place of the hogsheadful vitiated each hour by each person in the room.

CHEST EXERCISE FOR THE YOUNG

Here are a few exercises for widening the chest, which are equally good for delicate and healthy children. Let all stand erect in the aisles, with feet well turned out; let each slowly slap the back of his, or her, hands together high over the head, until they do it say twenty times a minute. Now they are opening up and expanding their chests, and making it easier than ever to make them large, full, and shapely. No corner of either lung escapes now, for this exercise makes the air rush to the top of each lung, the very part where delicate children get it least and need it most. They need exercise far more than they need study. Have them always breathe through the nose, not the mouth. Show them that God breathed into man's nostrils "the breath of life"; and how those nostrils warm and purify the air, saving the throat and lungs from chill and shock and other harm.

After twenty of these, and a rest for a minute, then twenty more. By the way, see how straight they stand after doing the twenty. They can hardly help it, for they have been pulling themselves up straight. Forty will do each day the first week. Make it eighty the second week, varying it in this way: instead of slapping the backs of the hands together high over the head keep the arms parallel and with straight elbows; swing the hands up high over the head till the thumbs touch. Do this also twenty times in a minute. Rest a minute, then do twenty more, taking care that all stand with straight knees. Those eighty need but eight minutes in all, including rests.

After the third week, let them rise high on their toes each time till their arms go up. This will be found to be work. So that ten of it, the last ten of each twenty will do. If this chest expanding comes a little hard upon corsets, collars, or other straps, they will have an object lesson as to how binding waist, wrist, ankle, or neck, or any other part of their body, checks and impedes its free action.

Many athletic persons think that it is more important to have the upper half of the chest larger than the lower; that if you measure large around the chest as close under the arms as you can, that is the main thing in having a fine chest. But only the small end of each lung is in the upper half of the chest.

The Lungs and the Heart

Far the greater part of the lungs is the lower half. Here also is the heart. So if you want large lungs, and a strong, easy-working heart, you must make their house—the lower half of the chest—as deep and roomy as you can. Whenever you find any one who can outlast others at any kind of really severe muscular exercise, you will almost always find that his lower chest is unusually large. There, as we have seen, Webster's was enormous.

There is a broad, thin, pancake-shaped muscle, lying like a great rug, directly under both your lungs. It is called the diaphragm. This is the great breathing muscle. It also is the great singing muscle. Every time you draw in a breath you push the middle of this muscle downward, and you press upon all the vital organs below it, so helping them to be more active and to do better work. When you breathe out, the middle of the diaphragm rises again. Watch a sleeping dog, and see how steadily his diaphragm acts. By practice, by thinking about it a little, and trying it each day, you will soon become good at diaphragmatic breathing. And every day that you improve at it you are getting stronger for almost anything you want to do, whether of work or sport.

Singing Expands the Chest

If every school class in America would sing ten minutes every day, with full hearty voices, holding the chest high up toward the chin, each child doing his or her best, while it might not be absolutely musical, yet the effect upon the general vocal power, and so upon the health of every singer, would be invaluable. Like all the exercises here suggested it will not cost one cent. It can be done in the humblest field school—such as Lincoln went to for but a few months in all—or in the best appointed school hall in America. If it is found that many become really fine singers, perhaps able to command generous incomes by their voices, the faithful teacher will never regret the simple but helpful work she did breaking them into line. But wider good will come to the weak throats and lungs; all too common and unchecked in our highly favored land, leading more victims to an early grave than any other cause.

Outdoor Spins for Schoolboys

Most of our schools have poor yards and grounds, while Eton, Rugby, and the great English schools have beautiful acres of greensward tempting the pupils to vigorous play. Some of our schools are as well off, but only a few, for we are very far behind in this important matter; and no schoolhouse ought to be built without a roomy playground. Never mind: let us take an average school—one with nothing worthy of the name of playground. On one or two sides of the block the street is paved with asphalt. That is good so far. Now, if you can get the authorities to have the other two streets asphalted you will have all the tools you need. If you cannot, let them run on the sidewalk.

Now start a squad of boys—say four abreast—at running slowly around the block once. Yes, slowly. This is important. Most of them are not fit at first for anything worthy to be called running. Have each hold his chin up all the way, as high as he can; breathe through the nose; breathe slowly; holding the arms straight down at the sides, hardly moving them at all. Before they are halfway around many will begin to find that they are not good runners. No matter. See that they do the things named.

The slow running has not called upon the heart to do more at first than it had been trained for, or was equal to.

All boys can run a little, as in baseball and other games But it is usually short, jerky work, harder than is good for them, and does not build them up much. Keeping the arms still, and letting the legs do all the moving, does not tire one half so quickly. But this slow, careful, steady running has already begun to teach them what most of them do not know —that is how to run. Tell them that if any boy feels that he cannot comfortably go the distance, even at this slow gait, he must drop out when he feels like it. Next day at recess let them do it again. Those who dropped out will go farther each day for the first week, and the second week once around the block will be enough.

In large cities at night, near a Young Men's Christian Association or athletic club, you often see runners in tights, flying over the asphalt at a hot pace. Do not let the boys try anything of that sort yet, they are not fit for it, but they will be. You are doing foundation-work.

In two or three months, when they are circling the block several times daily, they will begin to notice that their legs look better than they used to; that the tape measure at the larger girths above and below the knees show distinct gain, perhaps even a half inch or more, and that is a good deal; that they carry themselves better than they used to; that their eyes are brighter, their skins clearer, and—most gratifying to them —that now it is not as hard to run four or five times around the block as before it was to do it once.

Now you are beginning to get your pay. Your faithful work has told. You have done your full share to counteract the stooping, that work over bench or desk, and lack of care as to carriage, gives nearly to all Americans who earn their living indoors. You have been body-building and have builded well. The boys know who did it; that but for you it would not have been done—probably in all their lives would never have been done. The good has reached farther. In "School-Days at Rugby," when Tom went home at the end of the first quarter, he had not, to be sure, studied very much, and his marks did not indicate genius. But his parents rejoiced, for he did look so well. So you have done much for the looks as well as for the health and happiness of your boys. Indeed it is not unlikely that those few minutes of day of careful work may save the lives of more than one of your pupils.

FAST RUNNING

After a few weeks, running will be so easy that they will laugh at it. Then they can add to the distance each week till they are doing a mile daily. To a strong boy, over ten years of age, this is no work. In hare and hounds, boys not much older often run from five to eight miles at a stretch. And any vigorous boy should be able to skate all afternoon without harm.

In a six-day go-as-you-please race at Madison Square Garden, New York, some years ago, Rowell, an Englishman, ran twenty miles without stopping, as part of one day's walk and run of more than one hundred and fifty miles. He had simply magnificent legs, and a chest so developed that the work did not seem to bother him any.

What we want is to have every boy in America a fair runner, so used to it and so knowing how to run, that it will at any time be as easy for him to run a mile at a good pace as it is to walk it. If he makes in that condition, he will have vigorous lungs and heart, well-built legs; and if he has run with chin high, or drawn hard into his neck, an erect carriage besides, he will be far more likely to make a healthy, vigorous man than he ever would without them or their equivalent. So important is this branch of education that it should form a part of every school course, as riding and other exercises do at West Point; should win marks for faithful work, exactly the same as in other studies, and should affect the class standing of the pupil. He will soon learn the worth of this body-building in some form of contest where he avoids all the risks of the contest, yet gets much of the good. And if ever, through choice or need, he has to push his powers to the utmost, he will have some to push, and will be far more apt to come through with credit, than if, as with most of boys of to-day, he never had any systematic preparation.

Thus a few school exercises have been shown, aimed chiefly to bring vital power, to give each boy large lungs and a strong heart, and to teach him to keep them so; to show him that he cannot do without daily exercise any more than he can do without his dinner, but that it will pay him to take both. That if he builds his lungs and heart well, he makes all his vital organs healthier and stronger, increases his vitality and is apt to keep healthy and strong, to do more work and better work with head and body, and to prolong his life. That he ought to form the habit—and never in all his daily life to give it up—of daily vigorous exercise, of deep breathing all the time, of an erect carriage always, whether sitting, standing, walking, running, or at work, and as nearly as he can, of a straight position while asleep. Any boy who thinks for himself will see that if he has splendid lungs and heart, it will be much easier for him to build up any muscles he likes; those of his back by moving; of his legs by hopping, jumping, or skating; of his arms by using dumb-bells, exercising on the parallel bars, climbing ropes, poles, and ladders hand over hand; or every part of him by wrestling; than it would be for him or any other boy with small lungs and weak heart. That if our indoor life will shrink and weaken him, as it surely will, he must prevent it by daily using the means to be strong, erect, well knit, and enduring.

Training for Girls

What is there here not equally true as to girls? Who is apt to get on better anywhere in life: a girl, pale and weak, who tires easily; who has never developed body or limb; whose small feeble lungs, feeble voice, listless walk, and general air of helplessness at once tell all who see her that she is weak; and that unless she mends her way she is sure to go through life a care and a burden to others, and of little or no real help to any one? Or a girl with every muscle gracefully developed, with head well set upon a shapely neck, with high, superb chest, erect, lissome, step springy and elastic, a good runner, swimmer, skater, dancer, golfer, tennis player, sailor, fencer, or a skilled and nervy horsewoman, a splendid walker; her clear, bright eyes, exquisite complexion, sunny air, trained mind, and strong, high character combining to give her a face attractive, perhaps radiant with beauty; and an atmosphere so helpful and wholesome, that somehow she wins and owns all hearts? It is easy to answer.

Nearly every one of the things that she does not like, she can cure; and those that she does like, she can have, if she will use the means to get them. We have been seeing how boys can get many of them. And the same, or like ways, will build up the girls just as readily. With all our boys and girls at last with sensibly educated bodies as well as minds and characters, what else will do as much for the present and future of our race, will reduce its sickness and mortality, and will aid on all lines the development of our wonderfully favored land?

Exercise for the Middle-Aged

While children need bodies so trained as to help and not hinder them through life, most people of middle age and older need them even more. After the flush of youth, and during the years of confining work and care, men and women grow less active of body. They ride instead of walk, sit more, are on their feet less, drop the sports and games of youth, and physically, at least, become different beings. If the spirit and zest of youth, the keen enjoyment of all forms of diversion, of our natural appetites, and a disposition to look upon the sunny side of life can be kept up into middle life, and even into old age—as it has been by not a few men—others may find in their own cases the truth of the old saying that "a man is only as old as he feels."

But with the stress and exacting demands of middle and later life, the body does not work quite as easily as in youth. The inert habits, the riding to and from work, the neglected muscles and lungs lose power, and often size as well, and prove anew that "In all human action, those faculties will be strong which are used." Better play or exercise or work daily now as you once did, till, by the sweat of your whole body, you know that same splendid glow, and you are going straight to the roots of the disturbance, unclogging your mill, and making it grind nearly as well as it ever did. A German teacher of wide experience, a hundred years ago, wrote thus:—

"Our most celebrated physicians agree that the sources of health are to be found in pure air, cold water, wholesome and temperate diet, and due bodily exertion. Even infirm adults become healthy and strong when they apply to these with resolution, perseverance, and cheerfulness. The support of the body requires not nourishment alone, but the separation of what cannot be converted into blood; and what is daily thrown off from the blood is of this kind."

PERSPIRATION AND DIGESTION

Perspiration is the principal way in which this can be effected. The best means of promoting this is bodily motion and exercise. Perspiration depends on the circulation of the blood. The skin is the seat of small glands, which secure from the blood the particles that are to be discharged. These particles are conveyed from the glands to the pores of the skin, through which they are expelled from the system. Care must be taken, therefore, that abundance of blood be conveyed to these glands; in order to do which its circulation must be promoted. Another is the assisting of the digestion, the promotion of the appetite, the exhilaration and refreshment of body and mind. A third consists in the expulsion of pernicious humors; hence people who are accustomed to much exercise are little troubled with severe diseases: with stone, gout, ague, cachexy, dropsy, or hypochrondriasis.

Nothing in the world is a more certain and efficacious preservative than a sufficiency of bodily motion. "It excels every medicine that can be recommended for the preservation of health and the prevention of disease: and in this view may justly be called a panacea, as it not only removes the causes of disorders, but is an effectual means of strengthening the body and keeping it in a proper tone." Sensible bodily exercise is better known and understood to-day than it ever was before. There are more tools to aid in it; and the work without tools is ample and varied. Every indoor man, whose business gives his muscles nothing to do, ought to give them enough daily to do to promote copious perspiration, and so cleanse and purify the body more in this way than by all the other four cleansers —the lungs, liver, kidneys, and bowels. He can do it in any number of ways. But he must take some way, and follow it till the pay comes. His very business training and life will help make this easy. For they have taught him that, to make money, or do anything else, he must find the means and use them, sensibly and persistently, till he succeeds. The same rule applies in getting back his vigor.

The Medicine Ball

In the sporting goods windows, you see a "medicine ball" of leather, filled with rags, and somewhat larger than your head. Stripped till you can work with comfort, toss one of these to some one—a little more active than you are—standing thirty or forty feet away. Toss it in any way you like, only so that it gets to him; and always catch it on the return. If you have been using but one hand now try the other. When you feel like stopping, rest a little. Then toss with both hands, letting your companion stand a little further off.

"The liver is a sponge: squeeze it!" said an eminent physician. Sitting at your desk, or in common walking, you do not squeeze it. But every time you fling the ball you are squeezing it with a vengeance. Keep that ball going till your skin is as moist as that fast trotter's you saw flying past another on the road the other day. This lubrication of your machinery, and relieving the rest of your sewage system by calling on this neglected branch, which, as we have seen above, can do more work than all the rest of the service, is just what you need and have been doing without for years; and a muddy complexion, a draggy step, shortness of breath, perhaps also a coated tongue, are saying so. Had you held the ball in both hands far down behind your neck, and then thrown it as far as you could, your liver would have had a squeeze such as it had scarcely known since you were a boy.

Acquiring an Erect Carriage

Try some of these simple exercises. Aim always and everywhere to have your head on top of your spine—not as most heads are, poked forward. Keep the back of your neck pressed firmly against the back of your collar all day long. Always sit far back on your chair; hold your chest well up toward your chin, and breathe as many slow, deep breaths each day as you can. In a few weeks you will find that you are a different man; that the old, sluggish feeling has gone; that you do not easily get nervous; do not somehow tire; are fresher at the day's end; can work longer; and perhaps that some of those about you have been overheard to say that you are gettng better natured and a more genial fellow. Indeed, in every way you regard it, you find that the half-hour or more a day of attention to your body has been well paid; that depresson is now a stranger; that you work better, feel better, and even fancy that you look better than in the days when you neglected your body.

A Hint for Women

If the way is so open and easy for men to get rid of cumbrous flesh, impeding all their work and cutting down their comfort more than they are willing to tell, why should not every middle-aged or elderly woman, instead of fleshing up till the charming figure of her youth can scarcely be recalled, so care for her figure daily, by attractive, vigorous exercise, with one or more of her friends; now mastering this accomplishment, now that; fencing this winter, swimming in summer;

walking, as many women here and abroad do, from five to fifteen miles a day, with ease, or riding till she more than ever admires that matchless horsewoman, the late Empress of Austria?

In a few months she will find most welcome development and symmetry. The extra flesh will have gone, especially if she also has been faithful with the medicine ball, or other work that caused free and ample perspiration daily—for that is one of the safest and best ways yet found to reduce weight.

The Best Cosmetic

Fortunately, also, natural exercise is Nature's own cosmetic—the best yet found to insure a perfect skin. Daily, systematic, sensible exercise for her will bring back her youth to an extent surpassing belief; will give her vigor and elasticity alike of figure and of spirits; will, in effectiveness in any field, as in personal charm, do more for her than any other known thing can. And for all the time it takes each day, it is practically sure, whatever her fortune, wherever she is placed, to be her best investment; costing little or nothing, a safe, simple, joyful diversion; and if she shares it with a friend, she will widen the good she is doing, and will likely find, as one usually does when helping others, that she is getting more than she gives.

Daily Exercise Pays

It pays boys and girls. It makes them better in any games. It puts them and keeps them in cheerful, sunny spirits—a pleasure to themselves and to all whom they meet. It gives them not only fine muscles, but, far more important than in getting these, they make heart and lungs, stomach and digestive machinery, and all the other vital organs larger and stronger; it gives them a more roomy house to live in, and causes them to do high-class work. So it gives health; makes it harder for disease to get in, and drives it out more quickly when it does get in. It makes better blood; sending it to every part of the body, and the brain and the nerves share in the general wealth. For if you feed the brain on poor blood, will it do as good work as if it is well fed? That good and rich life blood makes the brain enjoy hard work, and makes work seem light; the brain can do far more, and is apt to do it far better, than with an inferior quality of nutriment. The man now not only thinks more clearly: he can think longer and more effectively. And in sport, as in work, staying power is a great help in efforts of every kind.

HEALTH-EXERCISE

How to Improve Your Health in Odd Moments

By EUSTACE H. MILES

NO longer do we live the healthy outdoor life which our ancestors lived. We are not so healthy in body as they were, though we may be stronger in intellect. To counteract the nervous exhaustion and other evils of city life we have to use means which at first seem artificial rather than natural; but it is better to use them than to be ill. I wish to suggest a few of the simplest here. They will be no great tax upon time or money.

First of all comes exercise; and a few kinds of exercise, out of some hundreds, may be discussed here. Those which necessitate a strain—that is to say, exercises of strength—often make people slow as well as making them muscular; and they may produce a large chest without producing a large expansive power of the chest: by this I mean that the chest may always be large, but not have the capacity of being larger when it is filled with air.

These exercises of strain or strength are generally bad for the young, who—owing to the relative size of their heart and arteries—need, instead, many exercises of speed. Nevertheless they have their use. But exercises of activity are better, and should be practiced in the early morning. The body should be stripped. A man should have his windows open, so that he may have not only the benefit of the exercises, but also of the light and air bath, which is so cheap and yet so valuable. A sun bath, with the head covered, is even better —when we can get it.

Systematic Breathing as an Exercise

One of the best kinds of exercise is breathing. The mouth may be kept closed, or a quill may be put in it. Anyhow, the breathing should be done slowly, chiefly through the nose, because the nose is meant to filter and warm the air. Standing with the chin back and the shoulders back, breathe in slowly, upward; then hold the breath and pat the chest all over; then let the breath out slowly and quietly. A friend of mine assures me that his chest expansion increased several inches owing to this exercise alone. One can test the growth of the chest by the tightness of the coat or waistcoat.

This will be valuable for the lungs and for the chest, and will be valuable for the whole body, because through the whole body runs the blood, and the blood is purified by the oxygen of the air. Such an exercise will also strengthen the heart. The commonest exercises to accompany the in-breathing and out-breathing may be summarized as follows: The beginner should do the in-breathing with the in-breathing exercises; afterward, when he has become skillful at breathing, he may reverse the process, and do the in-breathing with the out-breathing exercises, and vice versa.

Now, let us take one of the many exercises for the stomach. Lie down flat on your back and raise both your legs as high as possible many times. You will be surprised to find how few times, at first, you can do this. The legs may be kept straight, or may be bent as they come up.

Another good exercise, for other organs besides the stomach, is also one of the best (though one of the least known) for reducing weight in a short time. By its means a boxer has put himself into training almost immediately, and it is wonderful to notice how the muscles of the stomach begin to appear. Take a plank and lean it up against a wall, or incline it in some other way. If possible, have a small platform at the top of the plank. Walk up the plank; then turn round and walk down it.

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If you begin quietly and at a gradual inclination this is a good exercise for the heart. Instead of climbing perpetually, you are alternately climbing and descending. I can cordially recommend this for many purposes.

We have considered, then, the lungs and the stomach. Now let us have something which will help the kidneys. Bend forward and, with the palms of your hands behind you, pat and slap the body where the kidneys are. This will help them considerably, and may be tried several times during the day—if no one is looking.

Before and After the Bath

All these exercises are good for the heart, and the blood generally, and so is anything which will produce a sweat—for example, a Turkish bath. The best kind, of course, is one which leaves the head exposed to the open air.

A game of squash is fine, quick exercise for sweating purposes. It can be played by artificial light. The more you perspire through the skin, the more you relieve the kidneys of extra work, for poisons go out through the skin, as well as through the mouth and so forth.

The skin itself is helped by the air bath mentioned above, for the skin breathes in and out. Tar over a dog and it will die, because it cannot breathe through its skin, even though it can still breathe through its mouth. The perspiration will also be good for the skin, for the tiny pores of the body will be kept open. The unwary person often closes these pores with soap. I believe it is by far the safest plan to wet any part before you soap it; soap it, and then remove the soap; but do not put the soap on the dry skin. Of course, the skin is always helped by ordinary washing. It should be rubbed well—for instance, with loofah; a wet towel is nearly as good. By the way, when one is abroad, and cannot get a bath, a wet towel rubbed all over the body is almost as good. The color even of the underclothing is said to have an effect upon the skin; red is thought to be warming and exciting; blue cooling and quieting. Color affects not only the eyes, but also the surface of the body.

A helpful exercise is to twist the body. Stand with the heels together and with the hands on the hips; then, keeping the feet rigid, twist the shoulders round upon the hips as upon a pivot. This is a fine exercise for many games, such as golf, cricket, and lawn tennis. You may vary the exercise by keeping the top part of the body rigid and moving the lower part of the body with a twisting movement.

Foods and Their Effect

We have now mentioned some of the most important organs; the lungs and chest, the heart, the stomach, and the kidneys. We now come to the brain. Any exercise may help the brain by purifying the blood, so that all the above exercises will be beneficial to it. The blood circulates everywhere, and no one part can be benefited without every other part being benefited also.

I believe that food affects the brain more than anything else does. Of course, we need phosphates. It seems that the phosphates from wheat and other sources have an equal value with the phosphates from fish. This has been my personal experience. But, far more important than phosphates, which are so easy to get (for example, in Graham bread), is the use of pure proteid. Its importance has scarcely been realized.

The proteid must be pure and, if possible, free from stimulants. It is remarkable that, if we can feed the rest of the body, the brain seems to be able to feed itself. Apparently the brain is the last part of us to stop working. If we eat nothing, we use up, first our fat, then our cells and tissues. Everything has to give up its energy to the brain, as if the brain were the king of the city, and all the other inhabitants had to starve, if necessary, so that the king might be fed.

Another help for the brain is the use of cold water for the feet. It will draw the blood away from the brain itself. Walking barefoot on wet grass gives one of the most refreshing feelings that I know. Treading water in bath or basin is almost as good. Alternate hot and cold baths for the feet, or warm and cool baths, are an excellent cure for cold feet, and the same applied to the hands may serve as a cure for cold hands. And here I may mention a very simple way of keeping warm in cold weather. After you have had your bath and have dried yourself, wet yourself again before you put on your clothes. You will not catch cold if you do a few exercises afterward, but you will get a wonderful glow and harden yourself against catching a cold at all.

USEFUL ADVICE

It may be convenient to mention here a few rules for cold water bathing. Do not use cold water until you are warm. Warm yourself, before you use cold water, by warm water or exercise or massage. The second rule is always to use cold (or at least cool) water after using hot or warm water, unless you have had a very, very hot bath; that is the sole exception, I believe. After a very, very hot bath you do not need cold water. The third rule is to get warm *after* using cold water, as well as before using it; you can get warm by exercise or massage.

Coming back to baths that help the brain: one of them is the cold or cool bath for the head. Lie down on your back and let the back of your head rest in a basin partly filled with cool water. This can last two, or three, or even fifteen minutes. Cold water poured down the spine is one of the best of tonics.

Packs and rubbings are invaluable. They are liberally used in the nature-cure establishments in England, Austria, Germany, and America. Partial packs are the best. For example, you have a cold. When you go to bed you can take a towel or a piece of material of a similar kind. Wet it thoroughly in cold water; wring it out; put it round your waist, not too tightly, yet not too loosely; over this, and overlapping it on both sides, put two or three thicknesses of flannel; tie the whole thing up safely. You will soon get a most delightful feeling of comfort after the first cold shock, and sleep will be induced. In the morning, or if you wake up at night, take off the two bandages, wash the place well, dry it carefully, and rub it.

Sleep is invaluable for the brain, and one help toward sleep is massage of the head. The head can easily be massaged, either by the hand or by the massage roller. The motion should be up the forehead from above the eyes.

Kicking is another good exercise for the brain, and a good time for kicking is the early morning, as soon as you get up. If you are tired with work, stand and kick about for half a minute.

Early rising, followed by the alternate walk and run, which is less exhausting than a continued run, is, of course, magnificent for the health all round.

ECONOMY AND HEALTH

It seems strange to speak of economy as a help to health, and yet it is. Though it may not bring actual joy, it may do the next best thing—it may prevent worry, and thus prevent the bad effects of worry upon the blood, digestion, etc. You can economize in clothing by wearing few clothes. Those who wear few clothes are less liable to catch cold than those who wrap themselves up so carefully; and the washable clothes are often the cheapest. But the best means toward economy is the diet. It is curious that I should have found, after a very wide experience, that the very best foods for health, work, and training are also the very cheapest and the easiest to regulate. The basis of my own food supply is milk proteid, which is free from germs of typhoid, etc. It is not stimulating, as meat is, and is very, very rich in blood-forming elements.

People should eat slowly. Fast eating is a terrible curse in America; and, if you wish to eat slowly, you must begin by masticating consciously. Soon the slow mastication will develop into a habit, even when you go out to luncheon downtown! That is the supreme test. You must concentrate your will, your whole energy, on the subject of mastication, and bite your food, let us say, thirty times for the mouthful.

Practice concentration of will in all things; that is also a great source of health. When you brush your hair, think of that, and that only; let your mind, as it were, move into the muscles which you are using. When you have a bath, think of that, and that only. When you play a game, you think of the game; when you work, you think of the work; and you should extend this experience to almost all things in life. When you go through some of the commonest acts you should think of them; put your whole soul into them. Of course, this can be carried too far; but the commonest fault is never to try it at all.

IMPORTANCE OF MENTAL RELAXATION

Another help for the mind, and therefore for the health, is to practice image-forming in the mind. When you read, form mental pictures of some one doing something—only, of course, what you read must be pure and ennobling. How little we try to supplement and correct our character by image-forming. Yet, after all, a man's acts must largely depend upon the images which have been formed in his mind. Should not a coward study the images of brave men and get them into his mind as an everlasting possession? Should not the impure study the figures of purity? Should not the restless and anxious study the figures of restfulness and peacefulness, till they get these figures into their minds and can imitate them? There is not the slightest doubt that we can fill our minds with certain images, and afterward recall these at will, and, with these, recall the state of mind which they represent. We must have the power of bringing up before our minds any given picture. In order to aid this power, so little developed, as we grow older, we should try to draw from memory; then correct the drawing, and draw again. This is good practice for odd moments.

The most important image for the Amercan mind is that of relaxation. We must practice getting ourselves into a position of relaxation even when there is no need for such a position, just as we practice for a game long before the competition itself. Let a person stand with bent legs and with a smile on the face and with arms and hands and fingers hanging down limp; let him remain thus for a few minutes each day when he feels fresh, happy, and restful; then, when he feels tired or unhappy or restless he can resort to this position, and a feeling of contentment and repose will follow, "as the night the day."

When to Drink Water

Medical science has been wont to exaggerate the importance of internal remedies, but these are not to be neglected. Of these the greatest is water. If one is well, cool water may be best, and, anyhow, the times for drinking water are the early morning and the late evening—that is, just after and just before sleeping. If the blood is impure, the early morning water may have in it a little table salt. After this, there should be exercise before the meal. Again, if the blood is impure, hot water, the last thing at night or the first thing in the morning, may be the best. Here, again, one should not eat near the time when one drinks water.

One of the best forms of water is in fruit—for instances, apples; for here the water is soft and pure. Other fruits, vegetables, etc., have their various uses. Among these, onions and lemons may be mentoned. But the apple is the prince of fruits, partly because it has valuable salts, and also fiber, which our systems need.

What else shall we take besides pure water in some form or other? Is there any drug which is valuable? There are some who take salicylate of soda the last thing at night. This breaks up the uric acid in the blood. There are others who take aromatic spirits of ammonia, especially in some effervescent water. There are others who take bran-tea, which is good for the brain, or oat-tea, or tea made from almost any sort of fruit—for example, apple tea or black currant tea; but for a person in perfect health water is generally sufficient.

HEALTH–EXERCISE

How Athletes Train

By HORACE C. COLMAN

UNDER the headings of the various sports there is imparted the necessary information required by a man to become "fit" to excel in that particular department. All that is required to fill in any gaps is a general summary of the rules by which a man must be guided—rules bearing largely on his mode of life and surroundings; in short, the means by which he may "maintain his general health in the best possible state of efficiency."

First and foremost, his life must be one of absolute regularity. On this the success of all his efforts will largely depend. Of almost equal importance is moderation in all things, food, sleep, and muscular exercise. These two—moderation and regularity—form the keynote of all training. Whatever be the particular form of muscular work to be undertaken, undoubtedly the best preliminary training is walking. By walking, the muscles of the trunk and legs, the latter more especially, are hardened and rendered more efficient, the respiratory apparatus is stimulated, and, perhaps of greater importance, the heart and blood vessels are braced up, and so prepared to withstand the more arduous labor presently to be thrown upon them. An enormous difference can be wrought in the physical condition of a man by graduated walking exercise, of which fact advantage is being day by day more largely taken. By beginning on the flat, and then taking more hill work into the daily routine, in a short time there will be a considerable increase in chest expansion and muscular development.

Walking, again, is far the best method for removing superfluous fat. Clad in thick and numerous woolen garments, a man may rapidly reduce his load of fat by brisk and continued walking. Either at the very commencement, or as soon as walking has sufficiently raised the tone of the body, the aspiring athlete must strictly regulate his mode of life. This we may consider under the heads of *hours, food, drink, baths and clothing, surroundings.*

HOURS.—The vitality of the body is at its highest between the hours of 6 and 12 A.M., and at its lowest between 12 P.M. and 5 A.M., and from this we must conclude that "early to bed and early to rise" is a good rule, for the athlete at any rate. Bedshould be left at 7 A.M. in summer and 8 A.M. in winter; and a bath, of which more later, should be taken at once. Then should follow a smart run in flannels, at the end of which a rub-down with a rough towel is a *sine quâ non.* Three-quarters of an hour after leaving bed breakfast should be attended to. After this, as after every meal, should come half an hour's rest, but not a nap. The morning should then be devoted to the serious business of the day, be it rowing, cycling, running, or what not.

In the height of summer these times may be advanced an hour, to avoid the extreme heat of midday. At 12:30 or 1:30, according as the day started at 7 or 8, the midday meal should be taken, followed, as before, by a rest of half an hour. Then a portion of the afternoon should be devoted to work again, and finally the working day should end with a brisk walk, after which the evening meal should be taken. Bed at 10:30 at the latest. In ordinary life many men are satisfied with six to eight hours' sleep; but in a course of training there is far greater energy expended by the body, so that longer time of physiological rest must be given to it to repair the waste of the day's toil.

FOOD.—At one time the diet was considered to be the most important element in a course of training, but modern theories rather tend to the belief that, so long as the food is assimilated with no undue tax on the digestive apparatus, it is good.

Too much insistence cannot be laid on the importance of meals being taken at regular times. It is still a vexed question whether the morning run should be taken on an empty stomach or not, but probably an absolutely empty stomach is not the best. Immediately after the bath a plain water biscuit, washed down with half a glass of milk, will prevent that giddiness which is a frequent source of trouble when exercise is taken on an empty stomach.

A plateful of oatmeal and milk, followed by some well and plainly cooked dish of meat, is a sensible bill of fare for breakfast. Should the appetite permit, a lightly boiled or poached egg may be added, and, to finish up, some stewed fruit or marmalade.

Hot rolls, fat bacon, or ham are to be avoided, and cold toast should be substituted for bread. Variety is of necessity to prevent the growth of distaste for food that rapidly follows too monotonous a diet; and to obtain this, white fish may be substituted for the steak, chop, or mince. Salt fish must be avoided, because of the thirst it is apt to produce.

If a man is accustomed to take the chief meal of the day regularly at midday, he should continue to do so throughout his training, and this should correspond to the evening meal to be described later. If, however, it is his custom to nine in the evening, his midday meal should be as follows: Some well-cooked cold meat with green vegetables in small quantity, or artichokes. Potatoes, carrots, or parsnips are best left out of the dietary, for they take a long time to digest and are fattening. For sweets, a milk pudding, with stewed fruit or jam, will suffice. Cheese should be tabooed by reason of its slow digestion. There is no objection to a cup of well-made tea and a slice of bread and butter in the afternoon.

Six to seven is the best time for the evening meal. It should begin with a small quantity of clear soup; thickened soup should be completely barred. White fish may be taken, but the oily sorts must not. The principal dish should be meat. This should be well cooked, but not dried up nor yet raw. When muscular effort is demanded, there is no doubt that the average man requires meat and in liberal quantities. It has again and again been proved by experiments on groups of men that the best work can be done on a diet that largely consists of meat. The best is beef, and this should form the staple article of the chief meal, but it may be varied by mutton occasionally. Dinner should end with a light pudding and stewed fruit. Of puddings, the best of all is ground rice. Fruit can almost always be had, and when fresh fruit is not in the market, prunes are always obtainable. Fruit should not be eaten raw, and nuts must be faithfully shunned.

The man who likes his principal meal in the middle of the day must follow the above rule, and for his evening meal should content himself, about five or six o'clock, with a cup of tea and a slice or two of toast, and, an hour and a half before bedtime, take a meal similar to the midday meal first mentioned. The other man should take a cup of unsweetened pure cocoa and a biscuit immediately before going to bed. In general, food should be well cooked and plainly cooked. Spices, sauces, pickles, and relishes are to be avoided. Pastry and heavy things are bad, for they are not easily digestible and cause considerable distention of the stomach, and so impede the breathing. Bread should always be at least one day old, and for the most part should be toasted. Butter may be taken in moderation.

Drink.—The reduction of the quantity of fluid taken to the proper amount is a source of great discomfort to very many in training. With care a balance may be struck between the amount taken and that lost by the ordinary natural means, so that the sweat glands are not called upon to exercise their function.

The ideal method is to drink nothing between meals and nothing while actually eating, but to end each meal with a reasonable quantity of fluid. This happy state cannot be reached at once, but by gradually tending that way it may be reached by all in a very short time. Probably, one large cup of tea or coffee at breakfast, one glassful of some fluid at the midday meal, a small cup of tea in the afternoon, and one glassful and a half at the evening meal, added to the half-glassful of milk, or the cocoa, will be ample.

What to Drink.—It is certain that alcohol is not a necessity for training, and it is equally certain that it is not in many cases harmful. The man who is not accustomed to the daily use of alcohol should leave it absolutely alone. The man in whose dietary alcohol has a regular place may still continue to take it with his principal meal, but he must rigidly exclude it at all other times. As to the form, a light table beer or claret is the most suitable.

With alcohol we may consider tobacco. For the man in training tobacco is bad, in itself and from its haunts. Even in strictest moderation it causes the throat to be less moist than it should be, and so impedes respiration. Then again, the non-smoker seldom cares to stay in a room full of tobacco-smoke, and so the stuffy smoking-room atmosphere is avoided. Should, however, it be impossible to forego the weed, smoking should be strictly limited to the period of rest after meals, and, if possible, to the open air. The best form of tobacco is a light flake, the pipe of wood and freely drawing. Cigarettes and cigars are more deleterious than a pipe. A pipe in the smoking room before going to bed should be absolutely forbidden.

BATHS.—For ninety-five men out of a hundred the early morning cold tub is excellent. It should be taken immediately on rising, and a good rubbing with a rough towel given after it. The other five men who cannot stand a cold bath must take a hot bath.

A *warm* bath is bad, but a short plunge in a bath at a temperature of 112-115° is almost as beneficial as a cold bath; experience has shown that in hot climates it is even better. The danger of a hot bath is the tendency to stay too long in it, with the result that the bracing effect is lost and muscular slackness ensues.

CLOTHING.—Some form of woolen garment must be worn next the skin constantly. After each period of exercise, all clothing should be changed, and the body rubbed dry with a rough towel, and the discarded clothing thoroughly dried and aired, in the open air if possible. In this way several sets of flannels may be required; but the advantage of always starting in dry, well-aired clothes is too great to be omitted in view of the constant danger of chills from damp clothing. At night flannel pajamas should be worn; the bed should be a reasonably hard spring mattress, and the bedclothes light.

SURROUNDINGS.—Undoubtedly the final training should take place in the locality of the event to be competed in. By this means the system becomes accustomed to the difference in atmosphere and other local peculiarities, including the drinking water, which is of some importance to the digestive apparatus. For the man who till shortly before his race has been confined to a town, a short stay at the seaside is an excellent beginning to a course of training, but to continue throughout at the seaside is unwise, in view of the less bracing air in towns situated inland. An important item is the ventilation of the bedroom. Within reasonable limits it cannot be too cool; a hot, stuffy room contributes as rapidly to staleness as any other single factor.

Finally the man in training should have some mental occupation, not too absorbing, in order to keep his mind from dwelling too constantly on his chief business of the moment; a game at whist or chess in the evening is an excellent aid to sleep, but this must depend on individual idiosyncrasy.

STALENESS.—Pages might be written on the various causes of this bugbear of training, and pages more on its course and treatment. In a few lines it is impossible to do more than hint at these. Of causes, overwork, monotony of work, and mental worry are, perhaps, the principal. The last is largely out of control of the trainer, but a judicious man may with care prevent his pupil falling a victim to the other two. As to treatment, probably the best is complete rest from the matter in hand. By this is not meant doing absolutely nothing, but the boat or track, or whatever it may be, should be left alone for a day or two, and some form of exercise different and less arduous taken up. For instance, the boating man may try a round of golf or tennis and so on, and equally valuable is a change of scene.

In conclusion, it must be remembered that no two men can train in absolutely the same way, but the general laws here laid down will form a guide by which any man may hope to achieve success.

OUTDOOR RECREATIONS

Boxing

By J. D. CHAMPLIN and A. E. BOSTWICK

BOXING is the art of fighting with the fists. The boxer's hands are usually covered with gloves padded on the back with hair two or three inches thick to prevent injury from a blow.

The boxer usually stands with his left foot advanced, and on a line with his adversary, his right being in the rear and turned slightly outward, resting his weight chiefly on the right leg. The fists are closed, not too tightly, and the arms are held as shown in Figure 1.

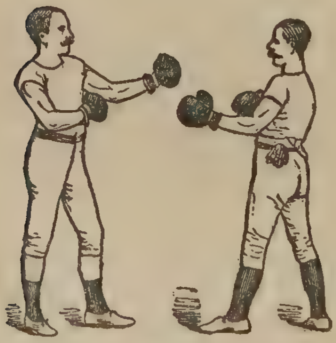


Fig. 1.

ADVANCING AND BREAKING GROUND

In advancing, the right foot is never put before the left, as in walking, but follows, falling nearly on the place from which the left was raised. Thus in advancing and retreating, the two feet keep at about the same distance. Retreating is called "breaking ground," and is always performed by first moving the right foot backward and then drawing the left back to the place just occupied by the right.

Both on Guard

The boxers stand so facing each other that the left fist of one is on a level with the other's wrist and their left toes are fifteen to eighteen inches apart. The left hand is used for striking when the opponent is just within distance, and the right when he is close. A skillful boxer makes his blows from the shoulder, and renders them more effective, when he wishes, by throwing the weight of his whole body forward. Blows made by swinging the arms like a windmill should never be used by a beginner. The learner should take care never to hit fiercely when out of distance, as it jars the muscles. The left foot and hand should be kept well in front, and, after delivering a blow, the boxer should move to the right, thus keeping away from his opponent's right arm.

Guarding and Stopping

Blows may be met by "guarding" or "stopping." The former means receiving an adversary's blow on the right or left arm, as the occasion demands; the latter is planting a sudden blow, which prevents the opponent's hit from reaching its destination. Thus, if the boxer sees that his enemy is about to deliver a body blow with his left, he may guard with the right, or stop the intended hit by delivering a quick blow at the adversary's face before he can get his head down, which would be his natural position in delivering the blow. In guarding the blows should be caught on the muscles of the forearm slantingly, and never, if possible, on the bone.

To be a skillful boxer, it is best to take lessons of one who is proficient in the art, as it is difficult to teach it on paper.

The four principal blows made use of in boxing, with their recognized guards, will now be described. They are—

1. Left hand at the head.
2. Left hand body blow.
3. Right hand at the head.
4. Right hand body blow.

The first is met by leading off in like manner at the opponent's head, at the same time throwing up the right, or guard arm, to catch his blow. Care must be taken not to obstruct the sight, for the boxer must never take his eye from his opponent. Each boxer thus makes the same blow (Fig. 2) and the same guard at once. This movement, which is very common, is called the "double lead and stop."

In guarding the left hand body blow, the boxer should bear in mind that it will fall on his left side and therefore must be taken on his left arm. The right arm must therefore be put up at once and the left arm dropped across the body, keeping the elbow well into the side and the forearm braced firmly against the ribs. As the blow is taken, the boxer should "break ground" a little.

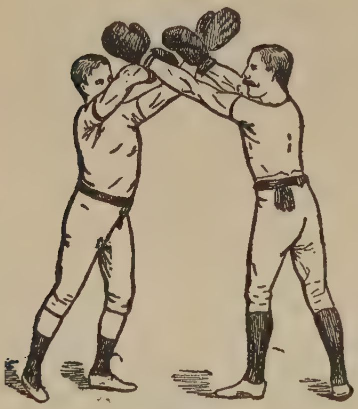


Fig. 2.

For a right hand blow at the head the usual guard is to raise the left elbow quickly, pointing it nearly in the direction of the coming blow, and at the same time drop the left fist toward the body, turning the palm a little outward. Leaning forward, the boxer catches the blow on the forearm, near the elbow, and at the same time retires slightly.

To guard the right hand body blow, the left hand is dropped almost at full length, the fist touching the inner side of the left thigh, and at the same moment the shoulder is raised quickly toward the chin, rounding the whole upper arm over the chest, and slightly turning the left side. The heart and the whole of the left side are thus completely shielded.

Feinting, Ducking, and Countering

Pretending to strike one blow when another is intended is called "feinting" and is a very useful trick in boxing. A feint may be made by an actual movement of the hand, or simply by glancing at one place and then striking at another. A movement of the head in sparring, called "head work" or "ducking," generally accompanies a counter (explained below), the head being bent toward the hand which delivers the counter. The rule is always to duck in the opposite direction from the enemy and not to raise the head till the boxer is out of his reach. There are three distinct "ducks."

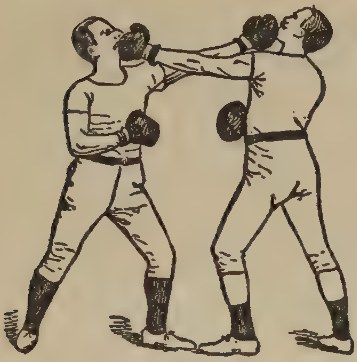


Fig. 3.

1. The duck to the right, allowing a blow to pass by the left ear.
2. To the left, letting a blow pass to the right.
3. Forward, lowering the head so that the blow passes directly over it.

The boxer must be careful not to duck too soon, or his opponent will have time to change the direction of his blow. When ducking, the opportunity should always be taken to deliver a blow at the same time. A "counter" is a blow given by a boxer when he sees his adversary about to strike, and is accompanied by a motion to ward off the opponent's attack. In a "plain" or "straight" counter both boxers strike at once with the same hands. The blows may both take effect (Fig. 3), or both men may duck (Fig. 4). In a "cross counter" as one boxer leads off the other strikes across the former's arm. The right hand cross counter is given by stepping in ten or fifteen inches as the opponent leads at the head, ducking to the left, turning the body so as to bring the right arm well up, and striking with

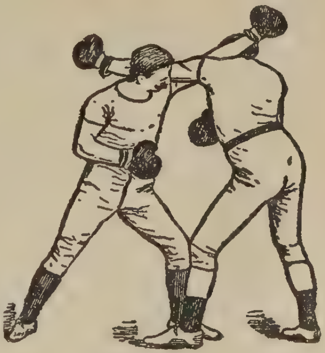


Fig. 4.

it over the opponent's outstretched left. The blow is naturally delivered upward at the jaw or chin, and the fist performs a quarter circle to the left. To master this blow constant practice and great agility are required.

Body Blows and Upper Cuts

Though the head and face are the main points of attack, the boxer should never let pass an opportunity to strike his adversary's chest or stomach. Such opportunities will generally offer when the opponent is leading at the head with either of his hands. When he does so, instead of ducking, guarding, or countering at his head, the boxer should aim a blow at his body, but as this necessitates stepping in closer, it should be certain that there is plenty of room behind for a retreat. A feint at the head, when a body blow is intended, often causes the opponent to throw up his right arm, thus exposing himself. In giving a left hand body blow, duck to the right; in a right hand blow, to the left, to avoid a possible counter. The right hand blow does not require such a long step forward as the left.

An uppercut should always be given when an opponent, trying to get in a body-blow, lunges forward with head in advance of his body. Drop the left fist a little and draw the arm back as far as possible; then swing it up quickly between the opponent's hands, so as to strike his chin or nose. The blow is aided by swinging the body upward. A skillful boxer often tempts his adversary to try an upper cut by throwing his head forward, and then, ducking, gives a heavy left hand body-blow, so an upper cut should rarely be tried against a clever adversary.

Side-Steps and Infighting

This is excuted by ducking smartly to the right as the opponent steps in, passing rapidly under his left arm by a movement like a run and jump combined, and facing him again by turning sharply to the left. This is an effective way of avoiding furious rushes, but must be as quick as lightning, and requires long practice.

Infighting takes place when a boxer succeeds in getting both his arms inside his opponent's, when he can give several blows in rapid succession, striking by swinging the shoulders forward and not by drawing the arm back.

Sometimes a boxer leads with two blows in succession, striking with left hand at the face, for instance, and then with the same hand, or with the right hand, at either face or body.

The beginner should practice each blow and guard separately, slowly at first, and then increasing in rapidity, returning to the position of guard after each blow.

The boxer should avoid getting excited, should fix his eyes on his opponent, and should try to tell by his movements what his intentions are. He should never do the same thing twice in succession. In some boxing contests, wrestling forms a part, but in others it is forbidden. In general, a boxer should avoid getting to close quarters with a heavier adversary, and with a taller opponent should direct his blows at the body.

Supplementary Exercise

Practice with Indian clubs and dumb-bells is good for the boxer, but his special exercise is that known as "punching the bag." Three kinds of bags are commonly used; the first, or heavy bag, weighs ten to twelve pounds and is made of chamois skin or kid stuffed with horsehair. It is suspended from the ceiling by a rope. The method of using it is to set it swinging and then follow it about, hitting it as it moves away from the boxer. The heavy bag should not be used by a beginner. The light or flying bag is of inflated India rubber. The object is never to let the bag get past without hitting it, and as it flies about very rapidly, this is excellent training for quick movement. The third bag is the one most generally in use. It resembles the flying bag, but is attached to the floor as well as to the ceiling and does not require quite as much agility to hit.

Boxing is valued highly as an exercise and also because it trains the learner to use his fists in his own defense, which he may at some time or other have occasion to do.

Rules of Boxing

The following are the boxing rules of the National Amateur Athletic Union:

1. In all open competitions the ring shall be roped, and of not less than twelve feet or more than twenty-four feet square.

2. Competitors to box in light boots or shoes (without spikes) or in socks.

3. Weights to be: Bantam, one hundred and five pounds, and under; light, one hundred and thirty-five pounds and under; middle, one hundred and fifty-eight pounds and under.

4. In all open competitions the result shall be decided by two judges, with a referee. A timekeeper shall be appointed.

5. In all competitions the number of rounds to be contested shall be three. The duration of the rounds in the trial bout shall be limited to three minutes each. In the "finals" the first two rounds shall be three minutes each, and the final round four minutes. The interval between each round shall be one minute.

6. In all competitions, any competitor failing to come up when time is called shall lose the bout.

7. Where a competitor draws a bye, such competitor shall be bound to spar such bye for the specified time and with such opponent as the judges of such competition may approve.

8. Each competitor shall be entitled to the assistance of one second only, and no advice or coaching shall be given to any competitor by his second, or by any other person, during the progress of any round.

9. The manner of judging shall be as follows: The two judges and the referee shall be stationed apart. At the end of each bout each judge shall write the name of the competitor who, in his opinion, has won, and shall hand the same to an official appointed for the purpose. In the cases where the judges agree, such official shall announce the name of the winner, but in cases where the judges disagree, such official shall so inform the referee, who shall thereupon himself decide.

10. The referee shall have power to give his casting vote

when the judges disagree, to caution or disqualify a competitor for infringing rules, or to stop a round in the event of either man being knocked down, provided that the stopping of either of the first two rounds shall not disqualify any competitor from competing in the final round. And he can order a further round, limited to two minutes, in the event of the judges disagreeing.

11. That the decision of the judges or referee, as the case may be, shall be final.

12. In all competitions, the decisions shall be given in favor of the competitor who displays the best style and obtains the greatest number of points. The points shall be: for attack, direct clean hits with the knuckles of either hand on any part of the front or sides of head, or body above the belt; defense, guarding, slipping, ducking, counter-hitting, or getting away. Where points are otherwise equal, consideration to be given the man who does most of the leading off.

13. The referee may, after cautioning the offender, disqualify a competitor who is boxing unfairly, by flicking or hitting with the open glove, by hitting with the inside or butt of the hand, the wrist or elbow, or by wrestling or roughing at the ropes.

14. In the event of any question arising not provided for in these rules, the judges and referee to have full power to decide such question or interpretation of rule.

History of Boxing

Boxing was said by the Greeks to have been invented by Theseus; and Pollux, Hercules, and other Greek heroes are described as excelling in it. It was always considered as one of the important features of the Olympic games. Instead of boxing gloves, the ancients used the *cestus*, an arrangement of leather strips wound around the hand and sometimes up the arm as far as the elbow. These were sometimes loaded with lumps of lead and were very dangerous. In ancient boxing contests the right arm was used chiefly for striking and the left for warding off blows.

The Romans liked to look at exhibitions of boxing, but considered it undignified to take part in them. Boxing was revived in England in the eighteenth century, when it began to be called "the noble art of self-defense." A teacher of boxing named Broughton, who is said to have invented the boxing-glove at this time, gave public exhibitions of his skill in a theater, which he built for the purpose. Boxing contests without gloves, called prize fights, were also held, but they became so brutal that laws were passed against them, and at present boxing is practiced by respectable people only as a form of athletic exercise. It is in favor principally in England and the United States.

OUTDOOR RECREATIONS

Camping Out

By J. D. CHAMPLIN and A. E. BOSTWICK

ONE kind of camping may be in connection with a walking trip, the campers spending their nights in a tent instead of at a hotel or farmhouse, and preparing their own meals. Each person may carry about twenty pounds of luggage in a knapsack or haversack, or in a roll, whose ends are joined to make a ring and thrown over the shoulder, in regular military fashion. Each should take a rubber blanket, a woolen blanket, a change of clothing, towel, soap, comb, and tooth-brush, besides his share of the general luggage, which includes the tent, cooking utensils, hatchet, and food. An easier but more expensive way is to have all the luggage carried in a wagon, leaving the walkers free. A larger tent and more implements can thus be carried, and the expense is usually not great if divided among several. It is often a good plan to buy a horse and cart for such an expedition, selling both at the end of the journey. If the camp is not to be moved, the tent may be still larger, and many useful fixtures, such as tables, a stove, an oven, bedsteads, etc., can be set up by any one of ingenuity.

A camp should be on dry ground, sloping so as to give drainage, and near good drinking water. Favorite sites are on mountains, at the edge of woods, on the bank of a lake, or on the seashore.

The expenses may vary at the pleasure of the campers, and according to the number in the party. Mr. John M. Gould, in his book on "How to Camp Out," relates that three boys, including himself, once went on a twelve days' camping trip and spent but one dollar apiece during that time. They "carried coffee, sugar, pork, and beef from home, and ate potatoes three times a day." Frank E. Clark, in an account of three weeks' camping on the seashore, gives the following list of expenses for six persons:—

Tent for three weeks,	$ 9.00
Provisions taken with us,	22.00
Stove and cooking utensils,	15.00
Fresh provisions bought at the beach,	15.00
Incidentals,	20.00
Total,	$81.00

This total gives an average cost of $4.50 per week for each camper. In general, the expense depends almost entirely on the way in which the campers are willing to live.

What has been said above applies also to campers of the other sex, or of both sexes, except that ladies must not be expected to bear any hardships A party of girls, in charge of an older woman, may camp together very pleasantly in not too wild a country, hiring a man to do the hard work, such as pitching the tent. When the campers are of both sexes, the ladies will naturally be allotted the cooking and other housework, while the men do the rougher work.

Campers are often annoyed by mosquitoes and black flies, especially in the woods, and, where these pests exist, mosquito netting must be taken for protection at night. Many preparations for keeping insects away by applications to the face and hands are to be bought, but most old campers prefer to drive them away by making what is called a "smudge." A fire is built to windward of the camp and smothered with wet wood and damp leaves, so as to make a dense smoke. The "smudge" is disagreeable, but is a welcome relief after insects.

If the rain is a cold one, it is often necessary to build a fire just outside the tent, but it is difficult to keep one alive in a hard storm. If there is a stove in the camp, it may be brought inside the tent, the pipe projecting through the door, but unless this is on the leeward side the smoke will be blown back into the tent. Another way is to build a fire in a hole just outside the tent and conduct the smoke through a trench under the tent, covered with flat stones, the crevices being cemented with clay. It is difficult to make this smoke-tight, but when it is so, it warms the tent well.

Each one of the campers should have his special duties assigned him. This may be done on trial at first, till it is seen for what work each is best fitted. Thus, in a camp of three, one may do the cooking, and another the dishwashing, while the third has general charge of the tent and its surroundings.

The material of the tent is usually heavy drilling or duck. The simplest kind is a shelter tent, which consists merely of pieces of cloth with buttons and buttonholes at the edges, by which several can be fastened together. The buttonholes are near the edge, and the buttons several inches nearer the center. The pieces carried by the soldiers of the United States army in the Civil War were about five feet square. They can be fastened together, and put up in various ways; for instance, by throwing two over a ridgepole supported on two forked uprights, and fastening them at the bottom, by driving pegs through the buttonholes, or through loops of rope sewed there for the purpose. If two more pieces be buttoned across the ends, the tent is entirely inclosed. The tent poles and pegs are not carried, but cut at the spot where the tent is pitched. A shelter tent (Fig. 1) is the best to use where the campers walk from place to place and carry all their own baggage. An end piece may be made to fit the end exactly, and sewed to one of the side pieces instead of buttoning it, if desired. The tent should usually be pitched with a right angle at the roof, but the angle must be sharper in rainy weather. Shelter tents may be made also of rubber, which are perfectly water proof, but heavy to carry.

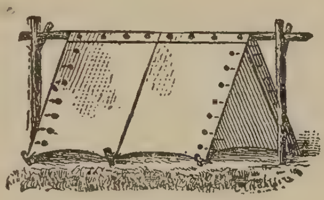


Fig. 1.—Shelter Tent.

An A or wedge tent is pitched over a ridgepole like a shelter tent, but is made all in one piece. A common size is about seven feet high, seven feet long, and eight feet wide. One end is usually closed, while the other has an opening in the middle, closed by a flap hanging on the inside. Around the bottom of the tent is sometimes hung a strip of cloth called a sod cloth, to keep out draughts and prevent the edge of the tent from touching the ground and rotting. Around the edge are also sewed loops of rope called "beckets," through which wooden pins are driven into the ground when the tent is pitched.

The best tent for a permanent camp, or one where the heavy luggage is carried from place to place on a wagon, is the wall tent. This is shaped like a house, with side walls about four feet high, and ridgepole about nine feet from the ground. At the corners of the eaves and at every seam along their sides loops of rope are fastened, and through each of these is passed a rope called a "guy," about ten feet long, knotted at one end so that it will not slip through the loop. The other end is passed around a peg driven into the ground at such a distance that the guy will have the same slope as the roof, and so keep the roof stretched. That the guys may be tightened easily, pieces of wood called "fiddles" are used, about five inches long, two inches wide, and an inch thick, having two holes bored through them three inches apart, just large enough to admit the rope. The end of the guy is passed through one of these holes and back through the other, and then knotted. The loop thus made is passed around the peg, and the guy is then tightened by pulling up the fiddle as high as it will go. Around the bottom of the tent, which also has a sod cloth, are beckets, through which pegs are driven. A second roof called a "fly" is used with a wall tent to keep out the rain, since the roof is not sharp enough to shed rain by itself. It passes close over the ridgepole, but is lifted several inches above the inner roof at the eaves, and projects about a foot beyond it. It is kept stretched by guys whose pegs are driven into the ground some distance beyond those of the roof. The end poles of an A or wall tent should have iron pins at the top, which fit into holes in the ridgepole, and the latter should have ferrules on the ends to prevent splitting. The end poles should be made too high for the tent at first, as it stretches with use. At first, the poles can be sunk in the ground a little way to make them short enough. Tent pins should be of tough wood, and have a notch near the top to hold the rope.

A shallow trench must be dug completely around the tent, after it is pitched, to carry off the water in case of rain. If the tent is on a hillside, no trench need be dug at the lower side. In a permanent camp, a board floor may be laid in the tent.

In the woods, shelters of poles and boughs are often used instead of tents. The simplest is made by placing a ridgepole across two forked uprights and then leaning poles and boughs against it from one or both sides. A rustic cottage (Fig. 2) may be made by trimming the branches from four trees standing as nearly as possible at the corners of a square, leaving part projecting as a rest for cross poles, thus forming a framework. These cross poles are tied to the uprights with willow withes, and then branches are woven in by passing them inside one pole, outside the next, and so on. A roof slanting in one direction is made in the same way and thatched with grass so as to shed water. If four trees cannot be found in the proper position, upright posts set in the ground may be substituted for one or more of them.

The simplest way to sleep in camp is on the ground, laying on it first a rubber blanket and then a woolen one. Evergreen boughs or dried leaves may be placed underneath the rubber blanket to make a bed, and the whole may be raised above the ground by a bedstead of poles supported on forked sticks. One of the best camp beds is a light folding cot (Fig. 3), covered with canvas, which may be bought at a furniture store. In a permanent camp a double mattress may be laid on the floor of the tent, over a rubber blanket, making room for several sleepers. Each camper must have one rubber blanket and one woolen one. A pillow adds greatly to comfort, but must be dispensed with if each carries his own luggage. In any case, beds and bedding must be carried out of the tent and thoroughly aired every morning. Unless a matrress is used, the camper's bones will be apt to ache for one or two nights, but he will soon get accustomed to his hard bed. The camper may also sleep in a hammock when the weather admits of sleeping in the open air. There is usually hardly room for one inside the tent.

The simplest way to cook is over a wood fire in the open air. A kettle may be hung over the fire from a crossbar resting on two forked uprights, and any food that requires boiling can thus be prepared. Broiling can be done by holding the food in small pieces over the coals with sharp sticks, if a gridiron has not been brought. For frying, the fire is built over a smooth stone, and scraped away from it when the stone is sufficiently heated. The stone is then carefully wiped, and is usually hot enough to fry several fish, or the flat stone may be placed on the top of a fireplace made of stones, and used for cooking while the fire is under it. An oven for baking can be built of stones. Where there is clay, one can be made by covering with it a cask or barrel imbedded in a bank. A fire is built in the barrel, which both burns it away and bakes the clay hard, making the oven. Such an oven is used by first building a fire in it and then scraping the fire away, and putting in the food to be baked. In every permanent camp, an ice box should be provided for provisions. This may be made by sinking an ordinary dry goods box or barrel in the ground, and if the box is

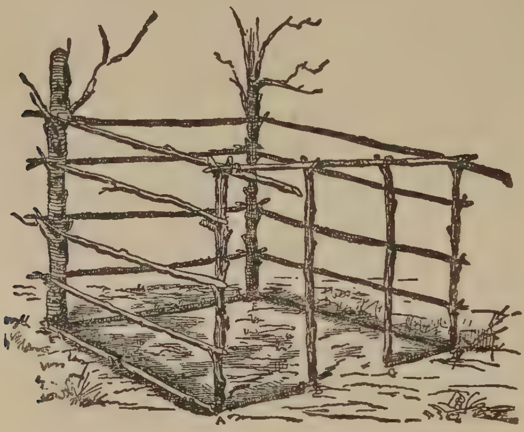


Fig. 2.—Framework of Rustic Cottage.

sunk deep enough, ice may be dispensed with. A hole should also be dug at some distance from the tent where all kinds of swill and refuse may be thrown and covered with earth every few days. The supply of food to be taken to camp depends largely on how much the campers expect to provide for themselves by hunting or fishing. Eggs and milk can often be obtained from a neighboring farmhouse. The necessaries for most campers are bread or crackers, coffee or tea, sugar and salt. Where the campers walk from place to place, carrying their own luggage, food must generally be bought from day to day wherever it can be obtained. Where the camp is permanent, the stock of provisions is limited in size and variety only by the purses of the campers, and the ability of the one who does the cooking. A small stove is often necessary in a large camp, and many different kinds of camp stoves are now to be bought. A kerosene stove is always useful in making a cup of tea or coffee, at short notice, or in cooking on a rainy day.

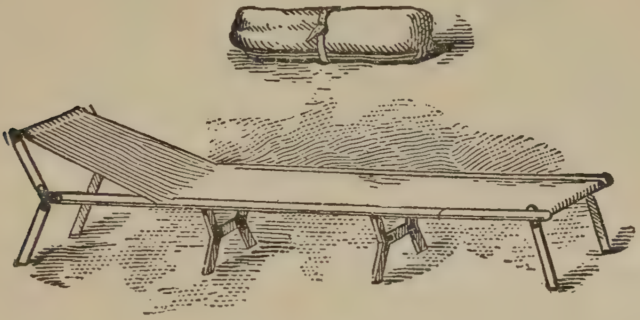


Fig. 3.—Camp Cot.

OUTDOOR RECREATIONS

Cycling

By H. GRAVES

THE balance of a bicycle is maintained by turning its front wheel toward the direction in which it is falling; in actual practice, of course, the tendency to fall is counteracted rather by the rider slightly inclining his body from side to side as required; but the first and more easily acquired method is that first to be attempted by the novice. If the prospective rider has not even an inexperienced friend to help him, he should procure a strong but antiquated and valueless machine, and lowering the saddle so that he can straddle the machine, and selecting a piece of road which has a very slight downward gradient, should throw one leg over the machine, seat himself, and, following the pedals round with his feet, do his best to put the above principle into practice. He should take care to keep the machine going fast enough to secure "steering way." The difficulty will at first be considerable, but he should remember that he can always save himself by sticking out a leg. As he progresses, he will discover how very slight is the force requred for steering, and how great a bias the mere inclination of the body exercises over the machine.

Should he possess a friend who will help him, his task will be easier; and it is to the latter that our instuctions are best addressed. The assistant should hold the machine upright by grasping the saddle springs so that the learner does not know for certain whether he is not riding by himself, and, running with the machine, give it that necessary motion which the learner is apt to minimise. Except to help in starting, he should

BICYCLING—THE START.

refrain from touching the handle bars. The novice, when he has fairly mastered the balance, should again select a slightly downhill road, and holding the handles and placing his left foot on the step, should hop on the other till the pace attained admits of his straightening his left leg and balancing himself with his other leg hanging across the back wheel, while the machine runs by its own momentum. After a little more practice he will discover that from this position he can easily and without assistance lower himself forward into the saddle, which should, as we have said above, be adjusted very low, and commence pedaling. He should next learn to dismount: this is effected by waiting till the left pedal is at its lowest and throwing the right leg over the saddle and back wheel, meanwhile retaining his grip of the handles. He will thus alight standing on the left of the machine. He will soon discover that he can dismount with the pedals in any position. The practiced rider will of course, in dismounting, throw as much of his weight as possible on to the handles, so as to minimize the strain on the frame caused by throwing it all on to the pedal.

Buying a Cycle

It is always best to avoid second-hand cycles unless you know their history, and they bear the name of a good maker.

The safest advice to give to a novice is a reference to one of the great firms, who, if they do ask a high price, at least have a reputation to uphold. By this we mean a reputation among practical and disinterested riders, not the proprietorship of a long list of "records" made by paid riders.

In buying or ordering a cycle, see that it is fitted to your own personal requirements. Insist on having your frame of full height; state whether you want brake and mud guards, and carefully specify your wishes in such details as shape of handle bars, material of handles, weight and gear of machine, throw of crank, and make of saddle and tires. The novice will do well either to get a friend to see to these details, or, failing this, to furnish the maker or dealer with particulars as to his weight, length of reach, as well as the kind of work for which he intends the machine.

If tempted to buy a second-hand cycle, look first at the teeth of the back chain wheel; any wear will be most apparent here. If the backward side of the teeth is deeply worn, have nothing to do with the machine.

Next test the bearings; if they will not run freely without considerable side shake and seem tight in one place and loose in another, considerable and uneven wear is indicated. Try also whether the head can be correctly adjusted. Next inspect the frame for twists, and see that the wheels "track." This is easily done if the machine is on a boarded floor; if not, judge it by the eye, or by a straight stick laid along the frame. See that the wheels are true and the tires in good order. Make sure that the chain wheels are in line; this is best ascertained by seeing that the teeth of the chain wheels do not rub against the side links. Test the frame for rigidity and keep a lookout for uneven places in the enamel that may conceal a crack.

Too many beginners are under the impression that when once they have mastered the difficulties of steering, mounting, and dismounting, their cycling education is complete. How general this fallacy is can be seen by looking at three out of every four cyclists one meets, who, while sufficiently expert at controlling their machines, are entirely lacking in that finish which stamps a good rider.

Correct Position

First of all, the machine must be properly adjusted. The saddle should be raised to such a height that when the pedal is at its lowest, the foot, with the heel well dropped, rests comfortable upon it, and the knee just misses being absolutely straightened at the joint; the center of the saddle should be about ten inches behind a vertical line drawn through the crank axle. The handles should be about level with the saddle, so that when one is sitting upright the handles can just be grasped. Many fast riders ride with a shorter reach, a more forward position, and the handles lower than this, but, for a beginner, this is by far the best position. When the rider is reasonably expert, he will discover for himself the position in which he can ride best; it is a great mistake to imagine that the same position must necessarily suit all cyclists.

Ankle Action

The great thing in cycling is to attain to an effective use of the ankles; if these be kept stiff, the power of each foot can only be exerted through a comparatively small arc of the circle described by the pedals. When the cranks are vertical, the rider will find that there is a "dead point," at which he can exert no power whatever, and the impetus of the machine is alone carrying him on. To overcome this dead point is the aim of ankle action.

If the ankle be relaxed, it will be found quite possible so to incline the foot to the leg that power may be exerted before this dead point with the rising pedal, and after it with the descending one, and the gain in efficiency is tremendous.

To this end the ball of the foot should rest upon the pedal: at the commencement of each stroke, before the pedal reaches the vertical, the heel should be dropped, and pressure at once applied to the pedal by a kind of clawing action; during the down stroke the heel will naturally rise relatively to the rest of the foot, till when the pedal is at its lowest the heel is uppermost; a further clawing action will bring the pedal past this point till it is again well on the ascent; the foot should then be lightly lifted, without of course leaving the pedal, but so as not to impede its upward course, till just before a fresh revolution is commenced the heel is again dropped, and the process begun afresh.

With good ankle action much of the work is taken by the calf muscles, which will be largely developed, especially on the side and toward the front of the leg. Pulling at the handles will be almost entirely obviated when the going is easy, and minimized when it is heavy. The practiced ankler will, for road riding at all events, be able to dispense with the uncomfortable "toe clip." This contrivance, necessary for the safety of the racing man, is to be eschewed by the novice, as it militates against the attainment of a good action. Its later adoption is a matter of individual taste.

In riding, the body should be kept absolutely at rest; fidgeting and wriggling in the saddle, and any movement of the shoulders, should be especially avoided.

As he progresses, the rider will discover that steering is effected not so much by the hands as by a gentle inclination of the body; this he will pick up automatically as he grows in proficiency, and to this end he should practice riding "hands off" not as an end in itself (nothing looks worse than cheap "showing off" of this kind), but to perfect his steering.

In no case is the difference between a good and bad rider more observable than on a rough road. In surmounting an obstacle a practiced rider will not allow his weight to descend heavily on the springs of the saddle, but will minimize it by momentarily shifting some of it to the handle bars and pedals, thus distributing the shock over the whole machine.

Mounting and Dismounting

Very few light machines are fitted with steps. Mounting on such machines is effected by placing one of the pedals (usually the right) slightly in advance of the vertical, and, standing if possible on higher ground than the machine, on the "crown" of the road, or best of all, on a friendly curbstone—by throwing one leg over the saddle so as to rest on the pedal, then with one movement applying the pressure to the pedal, and sliding into the seat. This mount is at first difficult in crowded streets, and riders who do much traffic riding should certainly use a step, but it puts less strain on the machine than any other method.

Several kinds of dismount should be practiced, as in crowded traffic there may not be room for any one given variety. Practice the pedal dismount on either side. A very useful way of getting off is to shoot back over the saddle, and alight straddling the back wheel; or more simple still, merely to remove one foot from the pedal and, as it were, step back out of the saddle. This method strains the machine least of all. Before trying these last two methods, make sure that you can straddle the back wheel with safety, and do not diminish your length of leg by bending the knees.

On greasy roads the wheels have a tendency to slip from under the rider: a certain amount of slip in the back wheel is immaterial, but when the front wheel slips the whole machine generally goes over. Corrugated tires minimize this danger to some extent: but the best safeguard lies with the rider. "Funk" and nervousness are fatal. Keep on the "crown" of the road, sit still in the saddle, ride at an easy pace, pedal lightly and carefully, and avoid back pedaling; hold the handle slightly and give the machine its head; if it is necessary to turn, do so gradually; be prepared to save yourself if the machine really goes, but don't jump off wildly because you feel a twitch from the back wheel. Tram lines should be crossed as nearly as possible at a right angle.

Descending Hills

None but an expert rider should ride without a brake, but such an appliance should only be used in the last resort; it ruins the tires, and, if applied to the front wheel, puts a great strain on the front forks, and promotes side slip. Moreover, if the brake from any causes refuses to act, the rider is put more at the mercy of Providence than is usually deemed advisable. Therefore, learn to check the machine by back pedaling. Pressure is applied by the feet to the rising pedal, using the ankles in exactly the opposite way to that advised for forward pedalling. If you find that, despite all your efforts, you are being forced out of the seat, hold yourself down in the saddle by one hand. Do not back pedal too suddenly, or you may break your chain.

Brakeless riders may improvise an excellent brake by applying the sole of the foot placed crosswise to the front tire immediately behind the fork crown. If mud guards be carried, this must be done in front of the crown, but it is less effective.

Hill climbing differs only in degree from ordinary riding;

and in this direction good ankle action will be found indispensable. Purchase is gained by pulling at the handle bars, not in jerks, but steadily. The best results are obtained by leaning forward over the handle bars, but on a long hill a change of position is beneficial, and the rider may lean backward, pulling steadily the while. Riding through deep mud and against a head wind come under the same category as hill climbing, but in the latter case it is absolutely necessary to lean forward in order to diminish the surface presented to the wind.

Points about Gearing

We need hardly explain that the higher the gear, the further the machine travels at each stroke of the pedals, and the greater is the force needed at each stroke to drive the machine. From this it will be apparent that for hilly country a very high gear is inadvisable; there is a limit to the amount of power which any rider can put into a stroke (e. g., a machine geared to 1,000 could not be driven at all), and as one approaches this limit, the effect of the heavy work is very tiring. This is especially noticeable in hill climbing. The power required for each stroke is greater than on the level, so that a gear which might easily be propelled along a flat road, might become unrideable on a steep hill. Assuming that the high gear machine succeeded in getting up, although the total power expended by its rider would, if measured in foot pounds, be the same as that put forth by a low-geared rider, yet, by the near approach at each stroke to the extreme limit of his strength, the big-gear man would soon be exhausted, while his low-geared companion, pedaling faster, but always well within his strength, would be comparatively fresh.

Again, a heavy machine is harder to drive up hill, so that a heavy machine necessitates a comparatively low gear, while a light machine may be fitted with a higher one. On the other hand, below a certain point, additional ease of driving becomes inappreciable on a level road, while the foot has to be lifted in preparation for the stroke very much oftener; as this lifting the foot is all power wasted, an unduly low gear exhausts the rider without giving any compensating advantage. Therefore, shun too low gears equally with excessively high ones.

Speaking generally, powerful riders will ride high gears, and light active pedalers low gears, but it is by no means always true. There is no doubt, however, that the development of the muscles caused by practice enables an expert to use with advantage a gear far too high for a novice. Let the novice of ordinary strength, therefore, riding a machine which "stripped" weighs, say, twenty-seven pounds, confine himself within the limits of sixty to sixty-three (for ladies six inches lower). As he increases in skill and strength, he will find for himself what gear best suits him. We may add, however, for road racing machines, sixty-eight to seventy-six is considered a medium, and anything over this is a high gear.

A good gear of this kind will be found valuable in a hilly district or for winter riding. It should, however, be remembered that *fast* riding uphill on a low gear is often as tiring as on a high one, hence, when the lower gear is switched on, the rider should be content to pedal no faster than with the higher.

A long crank throw increases leverage, but necessitates the moving of the feet through a larger circle than a small crank, i.e., it sacrifices speed for power. The normal crank throw is six and one-half inches, and for ladies six inches. A long-legged rider may, however, beneficially increase his throw up to seven inches (much above this is a mistake). A short-legged one may go as low as six inches. An increase in throw may, with advantage, be coupled with an increase in gear, or vice versa. It is, however, inadvisable for a rider to change the throw of his cranks; having once found the right throw he should keep to it.

The pedals should be wide enough to take ordinary walking shoes if necessary. The use of rubber or rat-trap pedals is a matter of individual taste.

Handle Bars.—For average road riding we prefer flat handle bars well brought back, inclined at right angles to the head. For very fast work they are usually "dropped" or bent downwards. The meaningless up-curved handle bars that have recently come into use among beginners should be avoided; a flat handle bar may be raised to any desired position, and we need hardly say that unnecessary curves in tubing detract from its strength.

CYCLING DRESS

The best material for cycling garments of every kind is wool—wool throughout. For casual riding there is perhaps no very great risk in riding in a canvas shirt, but if there is any prospect of getting hot, the danger of catching cold is considerable. Woolen garments permit of the ready escape by vaporization of the perspiration, and, being non-conductors of heat, keep the air within them at an even temperature; cotton, on the other hand, retains all moisture, and hangs, wet and chilly, on the body; being a ready conductor of heat, it at once exposes the wearer to all changes in the temperature of the air, besides permanently retaining perspiration in an unpleasant manner.

Firstly of underclothing. In summer a flannel shirt, preferably with a detachable flannel collar, is enough for any one. In winter this should be supplemented by a woolen vest and short drawers; omission of the latter in frosty weather tends to produce chaps and soreness.

The shape of cycling garments is mostly a matter of taste: for ourselves we prefer Norfolk jackets, which, having no particular shape to lose, may be suffered to lose it. No coat used for really hard cycling will retain its shape.

Numerous pockets are indispensable; the fit should be easy; the sleeves should not be too long; and it should always be possible to turn up the collar and button it closely over the throat. Waistcoats are a mistake; in cold weather sweaters and cardigans are preferable.

Knickerbockers should be fairly full, and may be made either with buttons or straps; if box-cloth "continuations" are worn, they should be wool lined. Knickerbockers should have a "hip pocket" to hold one's purse, as carrying anything in the ordinary side pockets, when cycling, is uncomfortable; the pocket is moreover liable to disgorge its contents. Cycling knickerbockers should all be double-seated *outside;* this requires an experienced cycling tailor, as, if it be unskillfully done, the seat rucks up into agonizing wrinkles.

Stockings may either be worn short and secured by the buckle of the knickerbockers, or may be long enough to fold over, in which case the end of the breeches is secured to the leg itself and the stocking folded over it. Tight garters are to be avoided; the best are plain bands of broad elastic. A wool-lined cloth cap is the best all-round headgear: in summer a felt "tennis hat" is even better.

Shoes should be of the orthodox cycling pattern: viz., round at the toes, flexible at the "waist," and with very low heels. The laces should be fastened by hooks all the way down and not by eyelet holes. In dry weather the variety which is attached by an ankle strap will be found satisfactory.

Many riders have the soles "clumped" and cut with slits for the reception of the plates of rat-trap pedals. Bars on the shoes are most uncomfortable for walking purposes.

Cycle Touring

The first step to be taken by the prospective tourist is to join a cyclists' touring club, which will furnish him with road books to nearly any civilized country, will equip him with all that he can desire in the way of garments, will defend him from the extortions of the European innkeeper and the *douanier*, and generally keep a watchful eye on his well being.

Do not start on a tour unless you are in good health and fair riding condition, which is soon attained by a few preliminary spins. Thoroughly overhaul your machine before starting; clean out the bearings with paraffin, and carefully adjust and oil them. See that your frame and wheels are true, the spokes taut, and the brake fittings in order. Above all things, do not start with a defective tire; if the jacket show any signs of disintegration, buy a new one at once and use up the old one in subsequent home riding A bad tire is an intolerable nuisance on a tour. We need hardly add that it is inexpedient to tour on a new and untried machine, and most of all on a new saddle.

It is as well roughly to map out your itinerary before starting, especially with a view to the forwarding of parcels of linen, to be picked up on the way.

DRESS AND LUGGAGE

Touring attire should follow the rules for ordinary riding dress, and no aberrations from the standard of all-wool clothing should be tolerated. In the way of footgear, stouter shoes than usual should be worn; the ordinary light cycling shoe, though good for its purpose, offers feeble resistance to wet and mud, and will go to pieces if much walking is done. Spats are uncomfortable, but indispensable in muddy weather. They should be as thin as possible.

A light waterproof cape should never be omitted. The quantity of extra clothing carried on the cycle should be cut down to Spartan limits; a heavy kit turns a pleasure into a toil. It is, however, not necessary to carry more underclothing than will suffice for two or three days, as fresh supplies can be sent to inns, post-offices, and railway stations en route. We prefer the last; the first ties one down to sleep or eat in the house which the hour of one's visit may render inconvenient, and post-offices keep shorter hours than railway parcel offices, the larger of which are nearly always open.

The irreducible minimum would seem to consist of two spare flannel shirts for evening and night wear (the former may afterward be promoted to active service), one or two spare collars (say one flannel and one linen), two or three handkerchiefs, a toothbrush, and a comb. Spare stockings, a hair brush, and shaving tackle come on the "margin of utility." The luxurious traveller who is contented to cumber himself may add to this list as his fancy dictates. Good soap, we may say, carried in a tin box or in a tobacco pouch, is conducive to comfort.

It is often our practice to stay several days at one place, and take long daily trips round about it; a complete change of clothes can then be kept at the inn, and afterward forwarded to the next stopping place. This obviates the necessity of carrying any luggage on the machine. In any case, for very long tours, a complete change of clothes should be sent on by rail: after three weeks' constant use, any suit will stand in need of a thorough cleaning.

How to Pack the Luggage

A simple outfit may be packed in a large sheet of waterproof cloth, rolled into a sausage-like parcel, and strapped upon handle-bar carriers; to omit these is a mistake, as the handle bars alone do not afford a firm enough hold to avoid shifting and consequent friction, and the cloth will rapidly be worn into holes. Large parcels should be carried on a "gridiron" carrier, clamped to the head socket. Further parcels may be carried behind the saddle in place of the tool bag, which may be strapped to the handle bars or the top tube. Valises which fit into the "diamond" of the frame are to be avoided, as in these days of narrow treads they hamper the knees of the rider.

Tools.—A larger assortment of tools should be carried when touring than when engaged in ordinary riding. In addition to the usual outfit of pump, spanners, oil can, and repair tackle, the following articles should be taken: A yard of stout copper wire in a hank; combined pliers and wire-cutters; screw-driver; spare nuts and washers; some strong whipcord; sheet rubber; extra large tube of solution; large piece of repairing canvas.

Do not degenerate into a "mile hunter"; remember that you are not a professional tourist, and are not bound even in honor to get anywhere in particular. Riding too far or too fast leads to "fatigue fever" and sleeplessness. The best rule is not to ride at all after dinner, Over exertion in hill climbing is to be avoided. One may, when touring, walk unashamed up even moderate gradients.

We take this opportunity of protesting against the habitual use of cocoa and similar stimulants when riding; we have good medical authority for stating that they afford no real sustenance, and that their use, unless very occasional, is decidedly harmful. Chocolate, raisins, bananas, or meat lozenges are far preferable.

OUTDOOR RECREATIONS

Bicycling for Women

By the COUNTESS OF MALMESBURY

ONLY a few years ago bicycling was looked upon as a pastime quite unsuited to women. The tricycle was used by a few who felt they needed more vigorous exercise than could be obtained by walking or playing a quiet game of croquet, and were unable to provide themselves with the more expensive luxury of a saddle horse. The advent of the drop-framed safety rendered cycling not only possible but pleasurable; and, with the addition of dress guards, mud guards, and pneumatic tires, bicycling was brought within the reach of all. To-day it is the means by which health is restored and recreation afforded to an ever-increasing number. To many it is simply a pastime, such as was before afforded by tennis or croquet; but to others it is the only means of obtaining pure country air, without the fatigue of long walks or the expense and trouble of a long railway journey.

It is curious that, despite the inherent love of sport which most Englishwomen possess, they should have been behind both the Americans and the French, who have set the fashion in wheeling. Now that we have discovered its charms, we shall be slow to give it up, even when the present somewhat exaggerated craze for it has ceased.

Hygienic Aspects

With few exceptions, the medical profession at first adopted an attitude of extreme caution with respect to cycling for women, regarding it with distrust, and discouraging it in every possible way; but now there is a distinct reaction in its favor, and only a few of the obstinately blind are found in opposition. There is no doubt that the bicycle has brought health to many a nervous, overwrought woman. All depends, of course, on the common sense displayed by the individual. The ordinary rules governing women's health must be applied in this, as in all other cases, unless serious injury is to result; but certain other regulations are also necessary for those not accustomed to sustained exertion. Experience is the school in which all of us must learn wisdom, and the pioneers of cycling have suffered many ills from the want of it. Their suffering has brought knowledge, which is valuable to others who have followed in their steps. A system of diet and clothing which is perfectly suitable to a person putting no strain on her lungs or heart, whose muscles are soft and undeveloped, and whose skin has only responded to the enervating relaxation of heated rooms, is not only inappropriate, but extremely dangerous to the cyclist.

The old axiom, that what you eat does you less good than what you do not eat, is a safe one to apply; and if a woman wishes to do good work and profit by it, both mentally and physically, she must resolutely turn from useless foods, which are incapable of replacing the waste caused by such active exercise as she obtains on her bicycle.

The rider must study her own idiosyncrasies, and never drive a willing constitution beyond its powers. Whatever women borrow from their capital of nerve force is only too apt to reduce their income of health for life. Bearing this in mind, women may derive enormous benefit from a form of exercise which increases the circulation, strengthens the muscles, develops the chest, relieves the lower limbs from the dragging weight of the body, and enables us to obtain far more fresh air than our powers would otherwise allow. No woman should ride if she has any serious weakness, except with great caution, and the permission of a doctor, who not only understands her constitution, but who has also made a special study of cycling in all its phases.

The different forms of hysteria, sick headaches, anæmia, and neuralgia, as well as imaginary ills, are specially benefited by this exercise. In the case of girls earning their own living and confined all the week in places of business, certain cycling clubs instituted on their behalf are a great boon. The members are taken in parties to various places of interest, and during their holidays pleasant tours are arranged.

DRESS

The question of dress comes next in importance. Anything tight on any part of the body is quite inadmissible, and wool next the skin is absolutely necessary to prevent chills, with their manifold evil consequences. The wearing of the skirt is still a much debated question. England has never encouraged the extremely unbecoming attire worn by many French cycling women, and it is to be hoped never will. The skirt, if properly cut, helps to conceal the ugly action of the knees and legs, and never need be a cause of danger, if fastened down by elastic straps, and not made too wide or too long. Of course, for professional riders, and women who cannot afford a well cut skirt, knickerbocker costumes are the only alternative; but for those who ride only for pleasure, a smart tailor-made skirt and coat (or blouse in warm weather) is the most suitable costume.

A woman's cycling dress should be, in the first place, practical—that is, composed of materials which do not suffer from rain or dust and will stand a certain amount of hard wear. The skirt should be about two and a half yards wide and gored, so as to fit closely round the hips, and put into the waistband in such a manner that it will be easy to arrange it so that it falls equally on either side of the machine. A moderately tight-fitting jacket looks neater than one of the loose sack-shaped coats. Attention must be paid to the arm-holes, which should be large and easy, while the sleeves are best loose, but not so large as to flap in the wind. The important point about the headgear is that it should fit well on the head so as not to be loosened and disarranged by every gust of wind, and that it be neat in appearance and not trimmed with flowers or feathers.

General Advice

In choosing a bicycle, care must be taken to suit it to the height of the rider; adjustment of saddle and handle bar being most important. The rider should sit erect, but not stiffly, and should, when once able to mount in the proper manner, have the saddle as high as can be comfortably ridden, as this gives greater power over the machine. A rider should always practice mounting and dismounting on either side, and be ready in case of accidents to put out a foot and so save herself from falling. As to the distance which a woman can safely ride, all depends on the special circumstances of the individual, the age at which she began to learn, her strength and constitution. While some can cycle seventy miles without fatigue, and can keep up a speed of thirteen miles an hour, others must limit themselves to a modest ten or twelve miles at eight miles an hour. Hill climbing is a serious source of injury to many, and must be attempted with caution. For all, and especially for those who ride in skirts, coasting is dangerous. If any part of the dress should catch in the quickly revolving pedals, a serious accident is likely to result. Racing is on all accounts to be deprecated for women.

On returning from a ride, every article of clothing should be changed at once. After sponging the skin with hot water, followed by a cold douche and a thorough rubbing, fresh dry undergarments should be put on. These rules strictly observed, all chills will be avoided, and the most delicate can derive nothing but advantage from an action of the skin which is one of the good effects of sustained exercise.

Cycling in Traffic

This is a vexed question; many consider it better for the weaker sex to abstain from doing so, but the matter really depends on the skill, nerve, and judgment of the rider. A woman who cycles in the streets of the metropolis or any other large city must learn the police regulations which prevail, and conform to them. She must not suppose her sex excuses her from doing exactly the same as others. Any act of courtesy on the part of cabmen and other drivers of vehicles should be acknowledged. A woman who has driven herself in town will naturally have an acquaintance with traffic, which will prove valuable to her as a cyclist, and will be aware that it is wiser in the long run to keep a whole skin and sound limbs, than to shave and scrape through narrow places at the risk of her life, and to the annoyance of other people. It is far easier and very often quicker to dismount and walk across a difficult crossing. There is nothing clever in wobbling about in the midst of a block of carriages and omnibuses, and causing drivers to use language which, though not pleasant for the ears of ladies, is perhaps excusable under the circumstances.

The numerous clubs which have been lately started for cycling women of all classes, have given them the opportunity of becoming expert riders, and also of seeing, during their club runs, remote parts of the country which are difficult of access in any other way. There is no doubt that, taken altogether, cycling has been one of the greatest blessings given to modern women. We can now scarcely realize that in years gone by delicacy was considered interesting, and that many girls would then have regarded it almost an insult to be called robust. That time has happily passed, and it behooves every able-bodied woman to look to it that she may be able to prove her strength and capabilities. For this purpose exercise of every sort in moderation and in the open air is necessary, and cycling will in future form an important part in her athletic education.

OUTDOOR RECREATIONS

Driving

By J. D. CHAMPLIN and A. E. BOSTWICK

THE beginner should practice with a single horse. The driver in America sits on the right side of the vehicle, and, if entering from the left, should get in before his companion to avoid passing over or under the reins, which should always be in some one's hands, unless an attendant be at the horse's head.

The horse should always be restrained from moving off until the driver gives him an indication to start. Many horses acquire the habit of starting when they hear any one get into the vehicle, from being struck with the whip by the driver as soon as he starts. The horse, expecting the lash, starts up to avoid it. To drive in the English style, the driver should hold the reins in his left hand, leaving the right free to hold the whip or to assist in turning or guiding the horse, or when a strong pull is necessary. The right rein should be held between the first and second, or second and third fingers, and the left between the forefinger and thumb, the ends passing through the palm of the hand under the fingers. The knuckles of the hand always should be turned to the left. The horse is guided by pulling the rein on the side toward which he is to turn, which may be done by twisting the hand up or down, or by pulling the required rein with the right hand.

The reins should be held short enough to enable the driver to check the horse quickly without leaning far back or taking a fresh hold, but not so short that he is obliged to lean too far forward or extend his arm awkwardly. The left elbow should be held well back and low down, and the arm allowed to play lightly from the shoulder. The right hand is used to hold the whip and to steady and guide the horse. It is best for the driver to sit high, for this enables him to give a steady pull on the reins when necessary. To make the horse go faster, he should be encouraged with the voice, the whip being used only when necessary. The use of the whip depends a great deal on the horse; some animals will not bear it at all, while others can scarcely be made to go without it. Some horses will go best with a tight rein, and some with a loose one; but the driver should always "feel" the horse's mouth. To stop a horse, the word "whoa!" is generally used, the driver at the same time pulling steadily on the reins. All sudden starts and stops should be avoided, as the result is to give those in the vehicle an unpleasant jerk.

DRIVING A PAIR

The horse on the right is called the off horse and the one to the left the near horse. These terms arose from the custom of the driver's walking on the left hand side of his team, whence the left horse was near him and the right one farther off. Most of what has been said above applies also to driving a pair, but in addition the driver must see that each horse does his share of the work, as some horses have a habit of shirking. The driver should watch the traces, and, if he sees that one of the team keeps his side loose, while the other's are tight, the offender should be touched with the whip.

DRIVING TANDEM

Two or more horses are sometimes driven one in front of the other. The forward horse in this case is called the leader, and the one next the carriage the wheeler. A horse, to make a good leader, must be specially trained; otherwise he is apt to step over the traces, or to turn around and face the wheel-horse. Tandem driving is the most difficult kind, and should not be attempted by a beginner.

Rule of the Road

When two vehicles meet, each turns to the right. In England the rule is to turn to the left, thus giving the driver who sits on the right a full view of the vehicle he passes, so as to avoid collision. It may be that the opposite rule was adopted in America because when the country was newly settled, the roads were narrow and poor, so that it was more necessary for the driver to see to his outer wheels than his inner. It is always better for a beginner to turn too soon rather than to wait, for sometimes the vehicles are approaching each other faster than he thinks. If one of the drivers sees that the spot where the vehicles are likely to meet is bad for passing, he should stop at the right side of the road, and the other should then drive quickly past him, so that he will have to wait as short a time as possible. Care must be taken in turning corners, or in passing a crossroad, lest there be a collision. When a vehicle is overtaken, it should be passed to the left, unless it is a heavily laden wagon on the left of the road, and no other vehicle is approaching, when it may be passed on the right. If a vehicle overtake another in a narrow road, the forward one should either keep ahead, or, if the driver does not wish to do so, he should turn to the right and let the other pass. If he does neither, the one in the rear should call to him and ask him politely to do one or the other.

OUTDOOR RECREATIONS

Fencing

By CAMILLE PREVOST

TO properly hold a foil, the thumb must be flat on the hilt (convex part), the forefinger grasping the upper part and the two sides, and the other fingers lying flat along the left side. The four fingers should touch each other, and a small place should be left between the third phalanx of the little finger and the under part of the hilt. Lightness in the grip, holding the foil mostly with the thumb and forefinger, makes finger play possible. The first position can be taken in two different ways:

(A) Place both feet at right angles, both heels touching each other, the right foot in front and pointing toward the opponent —the legs straight, the body upright without stiffness, and facing the opponent at three-quarters; both arms down, falling naturally along both sides of the body, the point of the foil in front touching or nearly touching the ground.

(B) The feet, the body, and left arm the same as above, the right hand holding the foil at the right of the head, knuckles upward and slightly to the right, the arm straight.

The first position (B) ought to be taken always by beginners before assuming the guard, and in assaults made in private. The first position (B) is used in public assaults and always when beginning an assault.

Second Position or Guard

When in the first position with the right hand low, the second position is taken thus:

Place the right foot at about two soles' length in front of the left heel, raise the left hand until on a level with the head, the arm half extended, rather backward; raise the right hand until nearly at the height of the right breast, bending the arm, and keeping the elbow near the body, but not touching it, and the point of the foil at about the same height as the eye. Bend both knees, keeping the weight of the body well divided between the two legs. Keep the body upright, shoulders down, without leaning either backward or forward, and always facing the opponent at three-quarters. The distance between both heels may vary according to the height of the fencer; when the legs are properly bent, the right knee must be perpendicular to the instep.

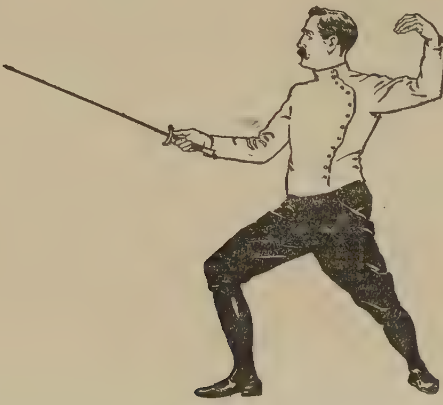


Fig. 1.—The Guard.

The second position, or guard, may be taken backward, by placing the left foot behind, at about two soles' length from the right, the rest of the movement the same as above.

When in the first position (B) with the right hand high, to take the second position, lower the right hand, knuckles downward, place it by the side of the left hip, and let the left hand take hold of the blade lightly as if it was in its sheath; raise both hands together to a level with the head, taking care to round the movement; let go the blade with the left hand, and place the left arm, half extended, rather backward, keeping the hand at the same height. Place the right hand in front, slightly lower than the right breast, the arm bent, the elbow near the body, but not touching it, the point of the foil at about the same height as the eye. Place the right foot at about two soles' length in front of the left heel, and bend both knees as above.

Third Position or Lunge

From the second position, or guard, stretch out the right arm, without any jerk, on a level with the shoulder, finger nails turned upward; advance the right foot about a sole and a half length, slightly raising the toes and allowing the heel almost to brush the ground; stretch the left leg and straighten the left knee, press in the loins and left hip, and lower the left hand toward the left thigh at a few inches above it. The right knee should be perpendicular to the instep, and the left foot kept flat on the ground. Great care must be taken not to drop forward, and the body should not be kept too upright, but in a slanting position, allowing a sufficiently long reach without compromising the retreat.

Observations on the Guard

Quickness and suddenness in the attack, readiness and firmness in the defense, and easiness in the retreat, depend on a good guard; therefore, great care should be taken in assuming that position. Until late years most fencers thought it preferable to have the body well "effaced," i. e., the body sideways, presenting the right side only, hoping to be exposed as little as possible to the thrust of the antagonist. This is an error which has been almost completely abandoned in France in the last few years.

The reasons that caused the effaced position to be wrong are the following. In regard to the defense, the effacement of the body makes it extremely difficult to keep a steady balance; it requires a constant muscular effort to turn the left shoulder and hip backward toward the left. The right arm becomes stiff, and this stops finger play and causes the parries to be slower and wider. In regard to the attack, the effacement of the body, stiffening the right arm, makes its extension slower. The hip, being turned backward, makes the left knee also turn backward, and places it perpendicularly over the left toes; the left leg and thigh then are not in a favorable position to give quickness to the lunge; and the body is so placed that the action of the loins does not come into play. On guard, the left hand should always be placed as indicated, the left arm being a very useful counterbalance to the right. It is most important that the body should be upright and its weight equally shared by both legs. If the fencer leans forward, he shortens his reach and exposes himself, and the weight of the body, bearing mostly on the right leg, prevents the right foot from moving properly forward in the lunge. If, on the other hand, the weight of the body is thrown on the left leg, the lunge becomes slow, as it cannot be done without a *jump*, or without a movement forward of the body before making use of the extension of the left leg.

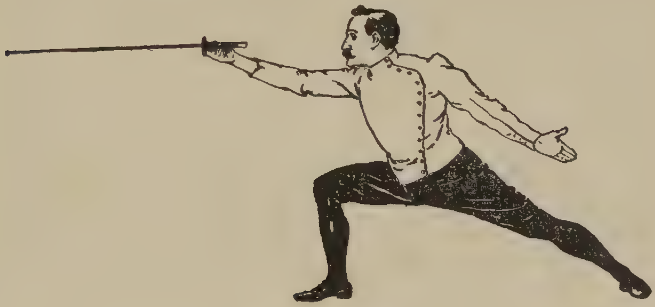


Fig. 2.—The Lunge.

Observations on the Lunge

A fencer must always bear in mind that quickness in the attack depends mostly on a supple and quick extension of the arm. The extension of the left leg must not begin the motion; the hand must start first, the right foot next, and the left leg must then push the body forward. These three parts of the lunge must follow each other so closely that they seem to be a single movement. To have a long reach, the body must certainly be *slanted forward*, but it is most important that it should not *drop forward*. The left hip must be well pressed in, and the loins tightened, or else the fencer will lose his balance and find the recovery extremely difficult. Care must be taken not to let the right knee overreach the foot; the knee must be just above the instep.

To Recover or Return on Guard

Just as the left leg pushes the body forward in the lunge, the right leg must, with the help of the loins, push it backward in the recovery; simultaneously, the left hand must be raised, the right arm and the left leg bent, and the right foot placed at about two soles' length from the left, and the position of the guard assumed. When on guard, the first position can be regained forward by bringing the left foot close to the right, and backward by placing the right heel near the left.

To advance, when on guard, advance the right foot first a few inches, and let the left foot follow over an equal space.

To retire or to retreat, when on guard, step back a few inches with the left foot first, and bring the right foot the same distance from the left as before. If, for some special reason, it is necessary to get instantly out of reach, throw the weight of the body entirely on the left leg, bring the right foot against the left heel, or, if needed, behind the left foot, without keeping the legs quite so much bent, and fall on guard backward, This way of retreating must only be used by fencers of some skill, and not by beginners.

The space between the right or the left of the blade and the limit of the body on the corresponding side is called the *line*. There are four lines: two high and two low. The two high lines are: the *upper* line on the right of the blade when pointed high, and the *inside* line on the left of the blade when also pointed high. The two low lines are: the *lower* line on the left side of the blade when pointed low, and the *outside* line on the right of the blade when also pointed low. A line is either open or closed; it is open when the opponent's point can hit the fencer's body; it is closed when the point cannot touch it. The two high lines cannot be closed at the same time; if the inside line is closed, the upper line is bound to be open, and vice versa. The same for the two low lines.

SIMPLE PARRIES

A parry is the action of warding off a thrust of the opponent's foil or sword. A simple parry is a direct parry which meets the opponent's blade in the line in which he thrusts. There are eight simple parries: four for the two high lines, four for the two low ones. They are: *Prime*, *Seconde*, *Tïerce*, *Quarte*, *Quinte*, *Sixte*, *Septime*, and *Octave*, and briefly may be described as follows:—

Prime—The right hand opposite the left shoulder, the thumb turned downward, the arm half bent, the foil pointed downward.

Seconde—The hand opposite the right hip (slightly higher), the finger nails turned downward, the arm straight without stiffness, the point very little lower than the hand, the blade almost horizontal.

Tierce—The hand on the right, the finger nails very slightly turned downward, the elbow near the body, the point on a level with the eye a little outside the line on the right.

Quarte—The hand to the left, the thumb uppermost, the elbow near the body, the point on a level with the eye and a little to the left.

Quinte—The same as quarte, with the finger nails turned downward, and the point further to the left. The hand may be slightly lower.

Sixte—The same as tierce, with the finger nails turned upward.

Septime—The hand opposite the right shoulder, the finger nails turned upward, the arm half extended, elbow down, the blade horizontal, the point opposite the left shoulder. In the position of septime, the wrist must be slightly bent: the upper part convex, the inner part concave.

Octave—The same as seconde, with the finger nails turned upward.

Theoretically there are eight parries, as described above, to protect four lines, two parries for each line, but this is a useless complication. Practically, one parry for each line is sufficient; therefore, following the celebrated French master, M. Bertrand's, example, we consider that four parries can be abandoned without any disadvantage, and they are the following:

1. Prime, which is a dangerous parry. It is slow and places the hand in such a position that, when deceived, the body is entirely uncovered. Septime protects the same line and is much more convenient. It is a much quicker parry, and the ripostes from it are more easily delivered and more rapid.

2. Quinte, which is a heavy and clumsy parry.

3. Sixte, because, the hand being turned finger nails upward, the parry is made with the help of the ends of the fingers, while with tierce, which covers the same line, the parry is made with the help of the thumb, the finger nails being turned slightly downward.

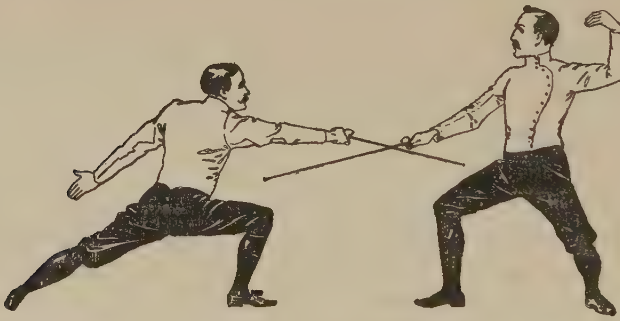


Fig. 3.—The Parry in Seconde.

4. Octave, for the same reasons as sixte.

There are two ways of making the same parry: by an opposition, or by a smart or dry beat on the blade.

In the parries of quarte and tierce, the point must be higher than in the ordinary engagement, so as to take the advantage of the fort of the blade on the feeble. As a rule, it should be about on a level with the fencer's eye, and if the opponent weighs on the blade the point should be still higher.

The Engagement

The engagement is the junction of the blades. There are as many engagements as there are parries, and they take the same names, i.e., the engagement in quarte, the engagement in tierce, etc. It may be either with or without opposition. It is with opposition when the opponent's blade cannot reach the body with a straight thrust, that is, when the line in which the blades are joined is closed. It is without opposition when the blades are placed so that the same line is open. The height of the point, when the blades are engaged in quarte or tierce (or sixte), should vary according to the opponent's size; if the antagonist is tall, it should be higher than if he is short. As a rule, the point must be placed in the direction of his eyes, more to the left if in quarte, with opposition, or more to the right if in tierce.

To change the engagement in the upper lines is to quit an engagement in one high line, passing the point under the opponent's blade, and to take the engagement in the other high line: from quarte to tierce or from tierce to quarte. In the changes of engagements from one low line to the other, that is, from septime to seconde, or from seconde to septime, the point must pass over the opponent's blade. Both fencers cannot have the opposition in the engagement, one of the two is fatally uncovered, and it is dangerous to attempt to get the opposition by forcing on the opponent's blade; therefore, the changes of engagements are very useful, as they allow one to take the opposition in the other line without any effort. Sometimes, when an adversary is preparing an attack, a change of engagement may oblige him to change his mind.

Finger Play

To have a good finger play (*doigté*) is to be able to direct the point and move the blade in attacking, in parrying, and in executing all movements in fencing, with only the action of the fingers on the hilt. The foil must be held mostly with the thumb and forefinger. These must act as a sort of pivot, the thumb giving the direction to the point, the three other fingers holding the hilt very lightly, giving momentary pressures when needed, either to move the blade properly in feints, attacks, or ripostes, or to form the parries or "attacks on the blade," or to support any shock on it. It is a great mistake to hold the foil with force, but the fingers must never quit the hilt; they must be in continual contact with it.

When parrying, the hand must be placed as explained for each parry, but when attacking, feinting, or riposting, the hand must be in supination, that is, with the finger nails turned upwards, this position of the hand being much more favorable for finger play; there are but very few exceptions, which will be explained in their proper place.

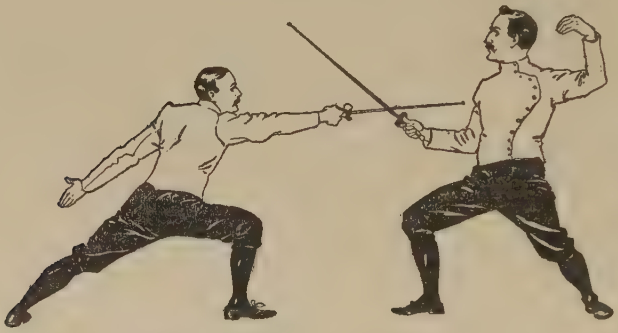


Fig. 4.—The Parry in Tierce.

The great advantage of finger play over arm or wrist work in fencing is that it gives considerably more quickness in the movements of the blade. With it the feints are more effective, and the opponent's parries deceived more surely and safely; the parries are more rapid and made with more precision; and if a parry is deceived by the antagonist, a second parry is more easily and quickly done; and ripostes are quicker and neater.

Simple Attacks

Attacks which are not preceded by a feint are called simple attacks. There are four simple attacks, and they can be executed in each line. Their names are: the straight thrust (*coup droit*), the disengagement, the cutover (*coupé*), and the counter-disengagement (*contre-dégagement*).

A fencer must bear in mind that, as the thrust is delivered with the foil or sword, the hand holding that weapon must move first in every attack, however quick the stroke may be. When a very good fencer makes a very quick straight thrust or a disengagement, the hand, foot and body all seem to move together at the same time, but, in fact, the hand begins the motion.

The Straight Thrust

This is the most simple of all the attacks. To make a straight thrust, straighten the arm, directing the point to the adversary's body in the line of engagement, and lunge. The direction must be given to the point with a pressure of the thumb while extending the arm. Some fencers direct the point first, placing the blade horizontally, and then straighten the arm; this is a mistake, because it involves loss of time, and the success of a straight thrust depends on quickness.

The straight thrust can be made in each line with the fingers upward or downward, but a good direction is much more easily given to the point with the hand in supination. When engaged in tierce, if the opponent keeps his point too low, the straight thrust can be made thus: Place the fort of the blade on the feeble part of his, straighten the arm, and lunge, slightly forcing in the line, with the hand high, keeping opposition to the right.

The Disengagement

To disengage is to quit the line in which the blades are placed and to thrust in another. In the high lines the disengage is made by passing the point under the opponent's hand; in the low lines, by passing it over the adversary's wrist.

When disengaging from the engagement in quarte in the upper line, pass the point under the antagonist's hand while straightening the arm, and turn the hand knuckles up, keeping it opposite the right shoulder, and thrust in tierce. The turning of the hand in supination, while disengaging, helps finger play considerably. The same for disengaging from tierce into the inside (or quarte) line, only with the hand slightly to the left.

When engaged in quarte, to cutover (*coupé*) into the upper line, raise the point by a movement of the thumb and forefinger, loosening the three other fingers, pass the blade over the adversary's, lower the point by a pressure of the last three fingers while straightening the arm, and lunge. The same when engaged in tierce to cutover into quarte. The *coupés* are not used in the low lines.

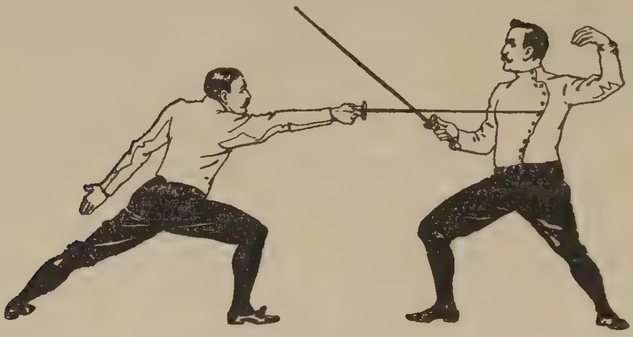


Fig. 5.—The Parry in Quarte.

The Counter Disengagement

This eludes a change of engagement or double engagement; or, when preceded by a feint, it deceives a parry. The counter-disengagement is very much like a disengagement in appearance, but as it cannot be done if the opponent does not move his blade first, *ipso facto* it is quite different. The disengage goes from one line to another; the counter-disengage comes back into the same line.

To protect one's self against above attacks with parries these instructions should be followed:

Against a straight thrust that does not quit the blade, in whatever line the engagement may be, take the opposition. For instance, if engaged in quarte with the line open, and the adversary attacks with a straight thrust without quitting blades, raise the point slightly so as to take advantage of the fort of the blade on the feeble, and send the opponent's point out of the direction of the body by closing the line with a pressure of the fingers. The same in the other lines. Against a straight thrust with the blades not engaged, close the line with a smart beat, the fort of the blade on the feeble.

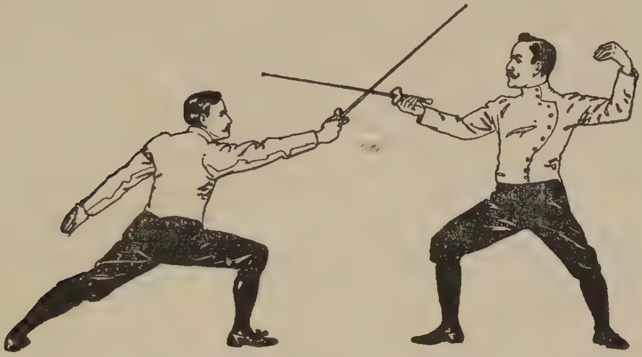


Fig. 6.—The Parry in Septime.

Against a disengage or a cutover into the inside line, parry quarte, or septime (this last parry protecting the inside line as well as the lower line). Against a disengage or cutover into the upper line, parry tierce. Against a disengage into the lower line, parry septime; in the outside line, parry seconde.

Against a counter-disengage from the engagement in quarte into the inside line, parry quarte after the change of engagement: from the engagement of tierce into the upper line, parry tierce after the change of engagement. If the counter-disengagement is abridged and the thrust delivered in the outside line, parry seconde; in the lower line, parry septime.

A feint is a sham attack, or, rather, the threatening of an attack without lunging. Its object is to mislead the opponent, making him believe in a true attack, inducing him to form a parry which will be eluded by avoiding his blade, and thrusting in an open line. The feint takes the name of the simple attack it simulates.

Attacks made with one or more feints are called compound or composed attacks. Feints should be made with finger play and the extension of the arm, but great care must be taken not to straighten the arm with stiffness and not to move the shoulder forward, because then the finger play would become impossible. There must be no jerk in the extension of the arm.

There is no English word equivalent to the French *contre*, but the French word *contre* is generally used with an English orthography and transformed into counter. Counters are circular parries in which the blade follows that of the opponent, and meets it again where the former engagement was, sending the point out of the direction of the body.

Attacks on the Sword

An attack on the sword is intended to get the opponent's blade out of the way before making an attack at the body, to disarm him, to check his blade in a parry, to prevent him from timing, or to draw an attack. The attacks on the blade are called: a pressure, a beat, a scrape, a twist disarmament, or a twist-and-thrust (*pressions*, *battement*, *froissé*, *croisé*, *liement*).

The pressure is the action of pressing on the blade in order to make an opening, either for a direct attack or with the intention of deceiving a parry, etc.

The beat is a smart tap on the opponent's blade. Light beats are more advisable than heavy ones, but they must be done very suddenly and with finger play only; if they are done otherwise they are very easy to avoid. Their object is to get the opponent's blade slightly out of the way for a direct attack, or, when followed by a simple or compound attack, to check the blade and render the parry more difficult and slower.

The scrape (this is the nearest English word for the French *froissé*), is made only in the high lines and mostly in the upper line (tierce). It can only be used when the adversary keeps his point low; it is still more effective when his blade is horizontal and his arm straight. It is meant either to disarm, or to send the other blade violently out of line. It jars the hand considerably. To execute a scrape, raise the point so as to place the fort of the blade against the feeble, the three last fingers loosened, and then with a vigorous pressure of the fingers, and especially of the thumb, and a three-quarter extension of the arm, bring the point violently down to the fort, near the hilt, sending the other blade away to the right, if in tierce, or to the left, if in quarte. It must be quickly and suddenly done, otherwise it would be very easily deceived. It is intended either to disarm or to open a line widely for a simple attack, or, less violently done, and followed by a composed attack, to deceive a parry.

The twist disarmament (*croisé*) is to send the opponent's blade violently from a high line into and out of a low line; like the scrape it can only be effected if the opponent's point is low.

The twist disarmament is executed thus: when engaged in quarte, raise the point so as to bring the fort of the blade against the feeble, loosening the three last fingers, pass the point over the adversary's wrist and violently bring the blades into seconde with a powerful pressure of the thumb and fingers, but mostly of the thumb, and with full extension of the arm; at the end bring the point slightly higher than in the parry of seconde.

When engaged in tierce, raise the point as above, and with the fort against the feeble, bring the blades violently into septime. If this does not completely disarm a fencer, it will at least loosen his grasp and jar his hand. The first described is the more telling of the two.

The twist and thrust is very much like the above, but is not intended to disarm, and for that reason is not so violent. It is an attack at the body as well as at the blade, with a continuous movement bringing the blades from a high line into a low one, or from a low one into a high one with a lunge. Like the *croisé* it can only be attempted when the opponent keeps his point too low and is more easily executed when his arm is stretched out. It is delivered thus: place the fort of the blade against the feeble, and, if in quarte, pass the point over the opponent's hand and thrust in the outside line with the hand rather low and a strong opposition to the right. This is the stroke called the "Flanconnade."

DECEIVING OR AVOIDING ATTACKS

The pressure, the beat, and the scrape are deceived by disengaging into the other line. The twist disarmament from quarte to seconde is deceived by a disengage into the upper line. The twist disarmament from tierce to septime is deceived by yielding the blade at the beginning of the movement, and disengaging into the outside line.

The twist and thrust being both an attack on the sword and the body, should not be eluded, as it would occasion a simultaneous hit, but the finale should be parried thus: From the engagement in quarte, yield the blade completely until the point is quite to the left, lower the hand on the right side of the other blade, raising the point, and take the position of quarte with opposition to the left. From septime: yield the blade at the beginning and parry tierce at the finish.

THE RIPOSTE

The riposte is a thrust delivered after a parry. The neatness of a riposte depends on the precision and smartness of the parry. Contraction of the muscles and too much force in the parry renders the riposte slow and heavy; but if the parry is well made, with the fingers, the riposte is the safest stroke.

Immediately after the parry, the fingers must be slightly loosened, and the direction must be given to the point by a pressure of the thumb. The arm must not be straightened with a jerk, but more or less extended with suppleness according to distance.

When, after having delivered an attack, which has been parried, a fencer has parried the riposte and thrusts again, this last thrust is called a counter-riposte. When the riposte has been parried with a recovery, the counter-riposte must be given with a second lunge. If the opponent has retreated while parrying and is out of reach, recover the guard forward parry the riposte, and lunge again with the counter-riposte.

A false attack is an attack made with a half-lunge, and not intended to hit. It is meant to threaten the opponent without the attacker exposing himself, to induce him to believe in a real attack, either to make him parry and riposte, so as to parry his riposte more easily and deliver a counter-riposte, or a remise; or to draw a time-thrust in order to parry it, etc.

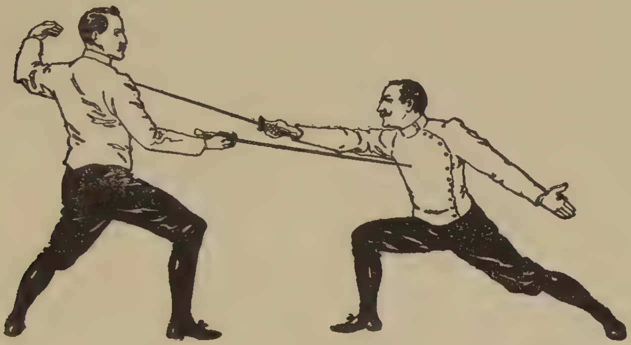


Fig. 7.—Direct Riposte After a Parry in Quarte.

Stop and Time Thrusts

A stop thrust (*coups d'arrêt*) is an attack made boldly with a full lunge as soon as the opponent moves forward to attack with an advance, stopping him before he can deliver his thrust. The least hesitation or preparation when executing a stop thrust would prevent it from succeeding, and occasion a most dangerous simultaneous hit. It is very useful against fencers who attack with a rush.

A time thrust is almost a parry and riposte undivided. It is a thrust delivered with opposition on a composed attack, barring or closing the line in which this composed attack is intended to finish.

Time thrusts require great knowledge in fencing, good judgment, and good execution. To make a time thrust, a fencer must have forecast the opponent's composed attack.

THE ASSAULT

The assault is a sham fight. It is the application of what has been described above and learnt with a master; it is impossible to learn fencing by one's self only with the help of a book. A master is required, and it is with his leave and with him that the first assaults must be made. The master must then moderate his quickness and not abuse his skill; he must allow the pupil to succeed with many of his strokes, and help him in every way.

Great care must be taken to follow the right principles, especially when beginning, because bad habits are very quickly acquired, and it is very hard to get rid of them. A fencer must always continue taking lessons, for that is the only way to improve. He could no more neglect to take lessons than a pianist could abandon practicing scales and exercises.

A fencer should not be too anxious to hit his opponent, and should never try to hit anyhow; if a fencer wishes to make continual progress, he must consider a hit he gives as a reward for a stroke well executed and well combined. The junction of the blades is a great help, it warns you when the opponent begins a movement, etc. If the opponent avoids joining blades, you must then not keep your blade too quiet in front of him, because it would favor his fencing. You must make use of false attacks, feints, etc., to draw an attack or find out his plans. If, on the contrary, the opponent has a heavy hand and weighs on the blade, then avoid joining blades and oppose lightness to his force, so as to give it no support.

One must vary strokes, and change plans, according to the opponent to be dealt with; practice of fencing depends on intellectual as well as on physical qualities; therefore, it is not possible to give advice against every method or way of fencing.

OUTDOOR RECREATIONS

Photography

By J. D. CHAMPLIN and A. E. BOSTWICK

IF a double convex lens, such as that in an ordinary magnifying glass, be held at the proper distance between any object and a white screen or wall, an image of the object will be thrown on the wall. Thus, if such a lens be held near a wall having a window opposite it, and moved backward and forward, a position will be found where the lens throws on the wall a distinct picture of the window, upside down. In photography, such a picture is thrown by a lens on a surface covered with some substance very sensitive to light. Light changes the color of the substance, so that the whole picture is printed on the prepared surface. The effect of the light, however, is not visible till the picture is washed in another chemical, called a "developer." It is then washed in a third fluid to "fix" it, or make it permanent. If the lights and shadows are arranged in the picture as they are in nature, it is said to be a "positive"; but generally the chemical used is turned black by light, so that the lights and shadows are reversed. Such a picture is called a "negative," and to make a positive from it, it is fixed over a sheet of chemically prepared paper. The light shines through the negative, blackening those parts of the paper most that are most exposed, that is those that are light in the negative; hence the lights and shadows are reversed again on the paper, and appear in their proper places. This is called "printing." The ordinary instruments and processes used in photography will now be described.

The photographic camera is a box, with a lens at one end for throwing an image of the object whose picture is to be taken. The image is formed at the back of the box, on a piece of ground glass, which can be adjusted at the proper distance from the lens. The most important part of the instrument is the lens. Cameras can be bought as low as $2, but the lenses of such cameras are poor and will not make a clear image. Experts advise the beginner to pay at least $10 for his camera. Modern cameras are made in many different styles, and fitted with many patent devices, which it is impossible to describe here. The best cameras have what is called the "single swing," by which the ground glass can be tilted forward or backward, so that parts of a landscape at different distances may be brought to a distinct focus. The best cameras have also a shifting front, by which the lens can be raised or lowered, thus bringing more or less of sky or foreground into the picture. These and other arrangements are useful but not essential.

LENS.—A good lens must have depth of focus, that is, it must clearly define both distant and near objects; a good field, that is, it must take in many objects at once; and it must be fairly rapid in its action. It should be provided with "stops," that is, covers with holes of various sizes, so that more or less light may be admitted to the plate. For instantaneous pictures very expensive lenses are needed.

FOCUSING-CLOTH.—This is to cover the operator's head when he is adjusting the camera, to keep out the light. It should be about a yard square, of any material that is perfectly opaque. It may be made of waterproof cloth, so as to protect the camera in case of rain.

FOCUSING-GLASS.—This is a little magnifying glass used to examine the image on the ground glass to see if it is perfectly distinct.

PLATE-HOLDER.—This is a device for keeping the sensitive plate from the light till it is ready to be used. It is then fixed on the back of the camera, in place of the ground glass, being so arranged that when a slide is withdrawn the sensitive surface of the plate receives the image.

DARK-ROOM.—For handling the plates before and after taking the picture, it is necessary to have a room or closet into which no light can possibly penetrate. The door must be tight and there should be no windows. A large closet will answer all purposes, but many amateur photographers have rooms specially built for this purpose. The closet should be as large as possible, to avoid discomfort from heat and bad air. It may be ventilated by means of crooked tin tubes, painted black on the inside, fastened to a hole in the outer wall. It should be remembered that the faintest glimmer of outside light may spoil the plates. To enable the worker to see, a "ruby lantern" must be used. This is a lantern covered with ruby-red glass, the light from which does not affect the plates. Many kinds are in the market. Instead of it an ordinary lamp, fitted with a close shade of red tissue paper is very often used, but the lantern is best. In this room must be placed all arrangements for developing and fixing the negatives, as described below. These include shelves, a sink, running water, and three shallow trays of iron, glass, or rubber, for immersing the plates or prints. The same chemical should always be used in the same tray. Hard rubber trays, which may be bought of dealers in photographic supplies, are in very general use. The sink may be made of a large baking-pan, having a pipe soldered to the bottom to carry off the water to a pail below. Running water may be obtained by putting a faucet in an ordinary wooden pail, which stands on a shelf above the sink. Over the faucet is slipped a rubber tube long enough to reach to the sink. For preparing the proper solutions, four "graduates" or measuring-glasses are needed, one each of eight, four, and two ounces, marked with drams, and one to measure minims, and for weighing chemicals a pair of scales is necessary.

Plates.—Formerly every photographer prepared his own plates, but now they are generally bought ready for use. There are many kinds, some for landscape, some for instantaneous pictures, some for transparencies, and so on. All come in different sizes, and are packed by the dozen in paper boxes. The face, or sensitive side, of the plate can always be told from the back by its duller luster. In preparing to take a picture, the first thing is to fill the plate-holder, which must be done in the dark room, the face of each plate being carefully brushed with a broad soft camel's hair brush to remove dust. Each plate should be held at the corner only. Plate-holders generally hold two plates, and these should be put in back to back, so as to face outward. It requires practice to do this without touching the sensitive side of the plates, especially as the light in the dark room is very dim.

Taking the Picture.—Place the camera so that the lens points toward the object or view to be taken, and then, throwing the focusing-cloth over the head, move the rear part of the camera forward, or backward, till the image on the ground glass is distinct. It often requires practice to see any image at all, at first, but by moving the eye backward and forward, it can be made to appear. Before the final focusing, the camera should be moved so that just the objects desired appear on the ground glass. To include more of the upper part of the landscape, the sliding front may be raised. If this throws some of the lower objects off the glass, the camera should be moved farther back. The focus is now made perfectly distinct for some one object in the middle foreground, the operator viewing its image carefully with the focusing glass. The image of more distant and nearer objects will probably now be a little blurred. To remedy this, one of the "stops" must be put on the lens. The largest should be tried first, and then a smaller one, till all parts of the picture are equally distinct. No smaller one than absolutely necessary should be used, as the smaller the stop, the less light falls on the plate. If there is an object in the very near foreground, it will be necessary to use the swing-back to make its image distinct.

The cap must now be placed over the lens, the ground glass removed, and the plate-holder put in its place, the focusing cloth being thrown over it as it is taken from the box where it is kept, and remaining over it till it is returned to the box. This is necessary that light may not reach the plate through some crack in the holder. The slide is withdrawn, and the light is admitted to the plate by removing the cap from the lens, taking care not to shake the camera in so doing. When the exposure is finished, the lens is recapped, the slide returned, and the plate-holder replaced in its box.

For the time of exposure, no rules can be given. It must be determined in every case by experience, as it varies with the light, the lens, the plate, the stop used, and the kind of picture. The time may thus vary from almost nothing, with a very sensitive plate and bright light, to ten, fifteen, or twenty seconds with poor light. In general a hazy or yellow light requires a longer time than clear weather, and hours near noon less time than late afternoon. Spring foliage requires less time than the same in summer, and a sea view than a landscape. After the photographer has had experience he will judge the kind of view, the light, and the other conditions, with those of some previous picture he has taken. A second or two more or less is not fatal to success, but over-exposure is easier to remedy than under-exposure. The beginner should make several exposures of the same view, and note which one turns out best. The plate-holder should be marked after each exposure with the time, stop used, and other data to be remembered.

Developing.—This process requires great care, and must be carried on in the dark room. There are many developing fluids, each of which has its advocates. The following directions show how to make one of the best. The solution is made in two parts, which are mixed as they are needed. Each may be held in a twelve-ounce bottle. The following chemicals are needed:

Sulphite of soda, crystals, ...	1 pound.
Carbonate of potash, granulated, . . .	1 pound.
Carbonate of soda, granulated, . . .	1 pound.
Pyrogallic acid, ...	4 ounces.
Sulphuric acid, ...	1 ounce.
Bromide of potash, ...	1 ounce.

Solution 1.—Dissolve two ounces, by weight, of sulphite of soda in eight measured ounces of soft water, add slowly half a dram of sulphuric acid, and then two hundred and forty grains of pyrogallic acid. Pour in enough water to make eight ounces of mixture. In warm weather, fifteen grains of bromide

of potassium may be added to prevent too rapid working. This solution is labeled "Pyro." It must be used only so long as it is perfectly clear.

Solution 2.—Dissolve one ounce each of carbonate of potash and soda in five ounces of water. Add enough water to make eight ounces of water.

Each solution should be poured into its bottle through a wad of clean cotton placed in a funnel.

When the developing solution is needed, the two solutions are mixed and diluted, in the proportion of one part of each to two parts of water.

To develop the plate, lay it in one of the trays, face upward, and pour the solution over it with a sweeping motion. Then move the tray so that it will be washed evenly, gently breaking all air bubbles with the finger-tip. The picture will shortly begin to appear on the plate, the very light parts first (which, of course, are black in the negative). If the plate is under-exposed, the details of the picture will refuse to appear; if over-exposed, the whole picture will appear suddenly. The negative should be examined by holding it up to the light from time to time, and as soon as the details are distinct enough, the plate is thoroughly washed with a stream of clear water from the rubber tube. If it is known beforehand that a plate is over-exposed, only half the ordinary quantity of the second solution is used, and a few drops of a solution of bromide of potash are added (fifty grains to the ounce of water). The bromide makes the process slower, the second solution hastens it; so by varying the proportions, a developer may be made to suit a plate more or less over-exposed.

Fixing.—Two solutions are needed for fixing: one composed of one part of alum to ten of water, the other of one part of hyposulphite of soda (called "hypo" for short) to five of water. The trays for fixing should be about two inches deep, and enough solution is placed in each to cover a plate. When the negative has been washed, after developing, it is placed in the alum solution for four or five minutes, washed again, and then in the "hypo" solution till no whiteness is seen on the plate, looked at from the back. This should not take more than ten minutes; the "hypo" should be renewed if it works slowly. Fixing may be carried on in a weak light, and after it is finished the plates may be exposed to strong light without injury. If the fixing is not thoroughly done, however, the negative will not last. After fixing, the plates are placed in a large pail of water, for several hours, the water being changed every twenty or thirty minutes, and they are then allowed to dry, without being heated.

Varnishing.—This is not necessary unless the plates are to be preserved a long time. Prepared varnish (to be bought of a dealer in photographic supplies) is poured on the plate, which is lowered first to one end and then at the other, so that the varnish flows evenly over the surface. The surplus is drained into the bottle from one corner, the plate being rocked to and fro to prevent drying in ridges.

Printing.—Paper all ready for printing may be bought, or it may be prepared by soaking albumenized paper in a bath of nitrate of silver, composed as follows:

Water, ...	64 ounces.
Nitrate of silver, ...	8 ounces.
Ammonia nitrate, ...	2 ounces.
Magnesia nitrate, ...	1 ounce.

Ammonia, one drop to each ounce of solution.

This solution is used over and over again, adding nitrate of silver and ammonia from time to time. The condition of the solution may be tested by putting enough shot into a glass tube, closed at one end, to float it upright in a bottle of the liquid. Make a scratch on the tube at the level of the liquid. As the latter gets weaker the tube will sink lower, and enough nitrate of silver must be added to float the tube at the same level.

The silver solution is poured into a glass tray, or one of shellacked wood, and the sheets of paper floated on it, albumen side down. One corner should touch the surface first, and the rest of the sheet be lowered evenly, so that no air bubbles may get under it. Light bits of wood are laid on the paper to keep the corners down. The paper should be floated from one minute and a quarter to two minutes (longest in winter), and then pressed between blotting papers and hung up to dry in the dark. Before printing, the paper, whether ready prepared or home made, must be exposed for from fifteen to thirty minutes to the vapor of ammonia, longest in cold weather. This is done most conveniently by hanging the sheet over twine in a box, in the bottom of which is a tray of strong ammonia water.

TONING.—This process changes the color of the print from reddish brown to brownish black. A stock solution should first be made by dissolving fifteen grains of chloride of gold and sodium in fifteen ounces of water. To make a toning bath for twenty prints, add three ounces of this to ten ounces of water in which have been dissolved a pinch of cooking soda and a pinch of common salt. The bath must be kept slightly alkaline, and should be first tested with the litmus paper. If it does not turn red litmus paper blue, more soda should be added. The prints are to be toned, about a dozen at a time, by laying them one by one face downward into a tray partially filled with the bath. It should be seen that they do not stick together. The bath should be kept at a temperature of about seventy degrees, which in a cold room may be done by setting the tray on a hot-water bottle. In ten or fifteen minutes the red color of the prints will turn to a purplish or brownish black. If the process is kept up too long they will become slate-colored.

If the prepared silver paper be used, the following recipe gives better results: Add to the gold solution a solution of cooking soda, drop by drop, till it turns red litmus paper blue. Add ten grains to acetate of soda and eighteen ounces of water.

FIXING THE PRINTS.—Soak them fifteen or twenty minutes in a bath formed by dissolving in one gallon of water a pound of hyposulphite of soda and a tablespoonful each of cooking soda and common salt. The part used should be thrown away, After fixing, the prints should be soaked three or four minutes in strong salt and water. They should then be thoroughly washed, the water being changed eight or ten times.

BLUE PRINTS.—These are made on blue or cyanotype paper

(Greek, *cyanos*, blue). The process of printing is as already described, the paper, as manufactured, being all ready to put into the printing frame with the negative. No toning and fixing is necessary, the print requiring only to be washed in pure water till the drippings cease to be yellowish.

Hydrochloric acid makes the color bluer, and sulphuric acid renders it greenish. A few drops of either are sufficient. Ammonia turns the color to purple and makes it lighter.

The ease of blue printing has made it popular with amateurs, and many use it for taking "proofs," even when they desire to print afterward in the regular way.

Bromide Prints.—Bromide of silver paper is very sensitive, and is used where quickness is sought and for enlargements. The paper is so sensitive that thin negatives are best printed by the light of a kerosene lamp. To enlarge a picture, the negative should be fixed in a hole in the wall in front of a heliostat, and a lens so placed that a sharp enlarged image of the negative is thrown on the sensitive paper, which is supported on an upright board. No light should enter the room except that which comes through the lens.

The print does not show at first, but requires to be developed, so that it cannot be told directly when the printing is finished, as with an ordinary photograph. The photographer must learn the proper time for exposure in various cases by experience, as in taking the picture.

Bromide prints are developed and fixed as follows: The developer is made by mixing three solutions, which are kept on hand separately.

Solution 1.—One pound of oxalate of potash to three pints of hot water. Add sulphuric acid till it turns blue litmus paper red.

Solution 2.—One pound of protosulphate of iron to one quart of hot water. Add one-half dram of sulphuric acid.

Solution 3.—One dram of bromide of potassium to one quart of water.

Just before developing, mix six ounces of No. 1 and one ounce of No. 2, and use cold. No. 3 is used to restrain the action in over-exposure, but too much of it spoils the print.

The developer, when mixed, should be of a clear dark red. If turbid, it is unfit for use. The image appears slowly. When it is done, wash the print several times in a solution of one ounce of citric acid in a quart of water, then rinse in pure water, and finally fix in a solution of three ounces of "hypo" to a pint of water. Fixing takes about ten minutes. Wash the print, place it in the alum bath, and then wash again. Dry by hanging on a line, not between blotters. Bromide prints last much longer than ordinary ones. They may be used for book illustrations, without mounting, by soaking in five ounces of glycerine mixed with twenty-five ounces of water.

MOUNTING.—Before mounting, the print should be trimmed to the desired shape, which is generally done by laying on it a glass or metal form and cutting around the edge. A knife may be used, but specially made cutters, formed of a small wheel, are preferable. The print should be laid, when cutting, on a piece of glass covered with paper. Glass alone dulls the cutter, and wood is too soft.

The prints are secured to the cardboard mounting with paste, which must be very smooth and free from lumps. All air bubbles must be pressed out from between the print and the card, and no more paste used than is absolutely necessary.

BURNISHING.—After mounting, the pictures may be passed through a burnisher. The photograph should not be perfectly dry, and should have its face rubbed with fine scrapings of castile soap.

TAKING PORTRAITS INDOORS.—The sitter should be placed obliquely near one window in the room, the light being shut out from all others by white muslin or paper shades. If the shadows are too strong, light should be reflected from the opposite side from a sheet hung over a clothes-horse. The background should be plain and simple.

HINTS ON LANDSCAPES.—A landscape should not be photographed from the shadow side, as it appears too somber. The best time for taking landscape views is in the morning or early afternoon, but late afternoon is the best time for cloud effects. When a body of water appears in the picture, a point of view should be chosen where the water will not appear as a sheet of white. Distant views are best taken when the air is clear and free from haze or smoke, though a partially cloudy sky gives an excellent light.

Flashlight.—Places which are always too dark to photograph by sunlight may be taken by flashlight. Magnesium "cartridges" to produce this light may be bought of dealers in photographic material. In using them, focus must first be made with the aid of lamp or gaslight. The lens is then capped, the slide drawn, all lights put out, the lens uncapped, and then the cartridge is lighted, making a sudden, short, and brilliant light, which takes the picture. The lens is then recapped, and the plate removed.

OUTDOOR RECREATIONS

Riding

By J. D. CHAMPLIN and A. E. BOSTWICK

THE art of riding can be acquired by practice only, but instruction from a good master is worth its cost. In this country the American, English, and German styles are all practiced.

The German style is rapidly passing out. The American style is generally practiced in the Western and Southern States, while in the Middle States the English style has become the fashion. The Germans teach to sit with a straight, stiff body, shoulders well thrown back, toes up and turned partly out, and heels well down, the back of the calf of the leg gripping the horse tightly. The American style is to ride with the body in an easy position, the toes lower than the heels, the knees grasping the saddle firmly, and only the toes in the stirrup. The English style is a natural position of the body, the foot thrust all the way into the stirrup, the toes slightly lower than or on a level with the heel. The American style is suited to riding easy-gaited horses only, or on military saddles, while the English style is suited to park riding as well as to rough riding and hunting.

The saddle and bridle should always be examined before mounting. See that the throat-latch (the strap under the throat) is loose enough to easily pass your four fingers between it and the throat; that the curb-chain hangs in the chin groove and is loose enough to pass a finger between it and the jaw, whilst the bit hangs naturally; that the saddle rests where it would lie easiest before fastening the girths: neither high up on the shoulder nor so far back that it will work forward; that the girths are not crossed or wide apart, and that they are tight, but not so tight as to give the horse pain.

The snaffle bit, used alone or with the curb, should be high enough in the mouth to touch its corners, but not wrinkle the skin; the curb an inch and a half below the corner of the mouth.

To Mount.—Stand on the left side of the horse near his shoulder, the body three-quarters facing him, the right shoulder farthest from him; take the reins up in the right hand and place them in the left. Grasp a lock of the mane with the left hand a little forward of the shoulder in such a manner as may be most convenient, meanwhile holding the reins firmly, but not pulling upon the horse's mouth.

Now take the stirrup in the right hand, putting the left foot into it. If you can take it without the use of the hand, so much the better.

Put the right hand well over on the right side of the cantle of the saddle (pressing downward to help prevent the saddle turning).

Rise with a good spring from the right foot.

Throw the right leg over, clearing the horse's back, withdrawing the right hand at the same time, and sink gently into the saddle; release the mane; turn the right foot inward and you will easily find the stirrup. (The *forward* end of stirrup as it hangs, should be turned *away* from the horse in putting the foot in). Lengthen the reins in the left hand by letting them slide through the fingers or by pulling them through with the right. If a whip is carried, grasp it in the palm of the right hand, butt up.

Another method of mounting is to stand opposite the saddle girths, grasp the pommel of the saddle with the right hand, which also holds the reins; take the stirrup in the left hand and insert the foot; take a lock of the mane, halfway up the neck, in the left hand, thumb uppermost; then proceed to get on as described above. This method does away with removing the support of the right hand as the leg is thrown over the horse's back. After one has learned to ride it is well to practice mounting from the right side, reversing the methods given above.

To Dismount.—Grasp the mane near the shoulder with the left hand, which also holds the reins; place the right hand on the right skirt; to steady the body, withdraw the right foot from the stirrup, and whilst throwing it over the saddle, slide the right hand back to and grasp the cantle, to ease the descent.

Restlessness in being mounted is often caused by the rider's foot tickling the horse's side, but oftener from rough treatment, or allowing the horse to rush off the moment the rider is seated: he should always be made to stand a few seconds. If he starts before you are ready to rise from the ground, say "whoa" and shorten the reins with the right hand to check him, then let them slide through the fingers to position. It is better to mount only half way, not throwing the leg over, and come back to the ground to quiet him, than to get on whilst he is moving. He may often be made to stand by shortening the right rein or reins, thus pulling his head to the right and holding it there until mounted. A simple way to make him stand, if very restive, is to let the groom pick up his off fore-leg and hold it close to the horse's elbow. Some horses do not like to have their heads held by a groom while being mounted and will be quiet so soon as released.

The Seat.—Sit without putting the feet into the stirrups, the weight of the body resting on the buttocks; shoulders back; elbows close, though not pressed to the body; the thighs grasping the saddle; the legs, below the knees, hanging perpendicularly and back far enough to cover the girths; toes slightly in; the side of the calf of the leg and the inside of the knee will then be found to grasp the saddle; the whole body at ease. A strong grip at the knee and with the inside of the calf is as important as the thigh grip, and is easily secured by turning the toes well in. The foot should be nearly parallel with the horse's body. The shapes of different men require modifications in the seat, but a good rule to bear in mind is "toes in and heels down." The length of the stirrup-leathers should now be regulated, so as to make the bottom of the iron hang about an inch higher than the hollow of the foot just in front of the heel of the boot, when "the seat" will remain as above described, excepting a slight throwing forward and raising of the knees. The length of stirrup, however, must be regulated, *somewhat*, by the feeling of comfort after trial. Having once ascertained this length, it will be found convenient to note it by measuring from the finger-tips, resting on the buckle of the stirrup (the latter, of course, being against the stirrup-bar of the saddle) toward the armpit, with the stirrup and leather under the arm. See how near the armpit the bottom of the stirrup comes, and thereafter, keeping this point in mind, the rider may know whether his stirrups are about the right length before mounting on any saddle.

One of the quickest ways to learn "balance," and to get "shaken down" into the saddle, is to ride on a pad a few times, or in the saddle without the stirrups, upon a gentle horse in a riding school, if possible; or, if no riding school be available, have the halter left on with the bridle, and fasten to it a rope twenty or twenty-five feet long; let an attendant hold this and cause the horse to trot in a circle and at the same time retain control of him.

It is a good plan to practice riding without stirrups (crossing them over the front of the saddle). In road or park riding, the stirrups may be under the ball of the foot. In hunting or rough riding, the foot should be pushed "home," that is, as far into the stirrup as it will go. Never use too small stirrups; there is danger of the foot catching in case of a fall. Stirrups with broad "treads" (the bottom where the foot rests) are the most comfortable. Do not ride the same horse upon all occasions; frequent changes give ease and security to one's seat and teach general management.

In first rides, only a snaffle-bit and a single pair of reins should be used, one rein being held in each hand. Any horse fit for a beginner will start upon the rider moving and loosening the reins and pressing the heels slightly. To turn, pull the rein on the side in the direction toward which you wish to go. If intending to turn, do not commence pulling until quite ready to change direction. Do not raise the elbows or hands in turning. To stop, slightly raise and draw in the reins, ceasing the pull as soon as the horse stops. Most Southern and Western horses are trained to guide by simple pressure of the reins on the side of the neck opposite to which it is desired to turn, and all well-trained saddle horses should be so trained.

Having become accustomed to the motion of the horse at a walk, he may be made to trot by steadying the reins, leaning slightly forward and pressing the legs against his side, clucking to him, or touching him lightly with the whip if necessary. There are two methods of riding at the trot: the close-sitting, and rising in the stirrups. In the former, the rider gives himself up to the motions of the horse, holding the body and legs without stiffness. It is possible for the rider who has attained good "balance" to sit upon most trotting horses without being thrown noticeably from the saddle, though on a rough-gaited horse it is very fatiguing.

In "rising to the trot," the rider partly raises himself and is partly thrown up from the saddle at every other step of the horse, using the knee as a pivot, aided by a slight pressure upon the stirrups. This rising is easily acquired, but must only be attempted when the rider feels the rise to be in accord with the step of the horse. Do not allow the legs from the knees down to swing backward and forward; nothing is more awkward. Keep the head and shoulders well back. Be careful not to throw the waist forward at each rise; it is better even to throw the head and shoulders forward to overcome this most awkward fault.

The canter is an acquired form of slow galloping. When a horse begins to canter, he turns himself a little to one side, that he may advance the fore-leg he is going to "lead" with, and he may be made to take this gait from a walk or slow trot, by lightly pulling and raising the rein, at the same time touching him with the heel, pressing with the leg behind the girths and throwing the greater part of the weight of the body on the side opposite the one it is intended to have him "lead," and causing him to increase his speed, at the same time curbing him. If the rider wishes him to start off with the right leg, the left rein must be slightly tightened and the left flank touched, and vice versa. In cantering in a circle, or on a short curve, the horse should always lead with the inside leg, that is, the leg toward the center of the curve. The reins should be held firmly but gently.

Mr. E. L. Anderson, a modern authority, holds that "if the horse is lightened in front (that is, made to raise his legs by a 'play' of the bit) he may be lightened more upon one side than upon the other by increased action of the bit upon that side." He, therefore, advocates that if we wish "to make the horse gallop by leading with the right side, we shall lighten that side by a '*play*' of the right rein, and bend the croup by an application of the left spur."

In the canter and gallop the body should not be held stiffly from the waist upward, but move with the horse.

The gallop is a natural pace, and consists of a succession of leaps, in which the legs of one side leave the ground after, but pass beyond, the legs of the other side. The horse "leads" or starts to gallop as in the canter, and may be made to "lead" as described above.

In riding the gallop, the rider's body is thrown slightly back, the knees hold the horse's sides firmly but not too tightly, and the hands are held low. In fast galloping the rider sometimes stands in the stirrups, holding by the knees to the saddle-flaps, and bending forward from the waist. The canter and gallop are easier for women, if the horse leads off with his right foot; but he should be made to lead off sometimes with the right, and sometimes with the left.

HOLDING THE REINS.—If only one pair of reins is used, they should be held in the left hand, by placing all the fingers between them but the forefinger, and then turning the ends under that finger and grasping them between it and the thumb. If it is desired to shorten the hold, the grasp can be loosened, the end taken in the right hand, and the left hand pushed up. In holding the reins thus, the thumb should be pointed forward, the little finger near the pommel, and the elbow close at the side. The right rein is now the upper one, and either it or the left can be pulled at pleasure by simply turning the wrist, without lifting the hand.

When the rider has gained experience, and rides with two pairs of reins, different styles of holding them are adopted. The following is one of the most common: The snaffle reins are held in the left hand, separated by the last three fingers and coming out between the forefinger and thumb, the curb reins being held in the same hand, the near rein between the third and fourth fingers and the off between the second and third, the ends coming out between the ends of the snaffle reins. Some riders place the curb reins on the outside and the snaffle reins inside, arranging the fingers as above. If it is desired to ride with both hands, the reins being in the left, the right hand (which holds the whip, butt uppermost) may be placed in front of the left hand and take the right snaffle rein between the first and second fingers, the thumb under it, not removing it from the left hand. Or both the right curb and right snaffle may be taken in the right hand. These methods may be practiced with reins or pieces of tape before taking a riding lesson. After a little practice, the rider can pull on whichever rein he wishes. Either the curb or snaffle may be the tight, or riding, rein at will; but it is not well to ride with both tight at the same time. The reins between the fingers should be held well up toward the knuckles and the hands firmly closed. As a rule, the hands should be held low and not far forward: about over the pommel of the saddle will give pull enough to control the average horse, and yet not look awkward. The learner should avoid depending on his reins to hold himself on his horse, and should be able to keep his seat without their aid.

Leaping.—A horse can be taught to leap by leading him over a bar, say, sixteen feet long, supported in any convenient manner. At first the bar should be held so low that he can step over it, and gradually raised until it will be necessary for him to jump. Care should be taken not to force or frighten him. Four or five leaps in a day are enough. When a horse is well trained he will jump moderate obstacles, either from a standstill or a walk. After he has learned to jump with the leading rein, he may be mounted and put through the same course. He should not be punished for refusing, unless he be a rogue. A nervous horse should be handled gently, and caressed and rewarded after his lesson, which should be ended after a jump, never after a refusal. In jumping from a standstill or walk, the rider first pulls lightly upward on the reins, speaking, and pressing his legs to the horse's sides to force him forward. As he rises, the rider bends slightly forward; but when the horse is in the air, he leans back, both to keep his balance and to receive the shock of landing without being pitched forward, resuming the erect position as the horse's hind-legs reach the ground. This leaning back may be learned upon a gentle horse by raising the right hand and throwing it back as if to slap him on the hind quarter as he rises. The reins are held not too tightly till the horse's fore-feet strike the ground, when they are tightened to give him support. In the leap from the trot or canter, the rider takes nearly the same position as in the gallop, but not leaning forward as in the standing leap. The bit is used only to direct the horse to the object over which he is to jump, the tension being eased just before he rises, that he may extend his neck, and resumed, as he lands, to steady him. If sluggish, the horse may be touched with the whip or spur, behind the girths, before he comes to the jump, but not at the instant he takes it, nor should he be encouraged by a cry, or by doing anything that might cause him to swerve. A horse can make a flying high leap best when he approaches it in a slow gallop, and the rider should never attempt to make him jump at so great a speed that he cannot collect himself for the leap. A high speed also prevents the horse from deciding where he should begin the leap, and confuses him. Only very expert riders are warranted in interfering with a horse in taking his jumps; most horses jump best if allowed to "take off," or leave the ground, as they please, the rider only steadying them a little if they rush at the obstacle. There is a great deal of nonsense in the idea that a horse can be "lifted" and "helped" over his jumps; and it is usually novices, or very young persons, who attempt these feats: one might as well try to "lift himself by his boot straps" as to "lift" a horse over a jump. If the horse is sluggish, he must be enlivened with whip or spur, or by moving the bit in his mouth; but not the *instant* he is to "take off" the ground. The rider must not pull his horse as he rises, nor whilst he is in the air—to do so shortens the jump; if the rider cannot sit the jump, after a few trials, with the support of the reins, he had better improve his seat before continuing the sport.

In training a horse to jump, he should be made to leap only a few times at first, as he uses muscles not usually put to a strain, and, moreover, will learn to dislike it if made tired. Horses seem to like jumping in the field with the excitement attending the hunt, but some of the best judges say they never like it: they certainly dislike being "schooled," and jumping in cold blood. Always save your horse in hunting: take the fewest jumps necessary, and go through a break in the fence, or through a gate, when you can. Ease your horse in going over plowed ground, or uphill. If waiting at a "check," dismount and loosen your girths, and shift your saddle an inch either way.

Balking.—If a horse refuses to move, or balks, wait quietly for a minute and he will often go on. Sometimes he can be made to go by moving the reins gently, and urging him with voice or whip; sometimes by pulling him around in the direction which he least resists; or, often by turning him around, sharply and quickly, a number of times (thus confusing him), and then starting in the desired direction. A little dirt from the road put into his mouth often so distracts a balky horse's attention from his obstinacy that he will move on.

Rearing.—The young horse is apt to rear, if pulled and excited. When he rises, loosen the reins, even if you must hold on by the mane or neck; press the legs closely to him, well back: this has a tendency to bring his hind legs forward, and experts often use spurs, applied well back, to bring him down. Try to keep him moving either forward or in a circle, and pull his head toward either side if he is about to rise. If he is about to fall backward, try to throw yourself off to one side. A confirmed rearer is too dangerous to ride.

Shying.—Shying is sometimes caused by near-sightedness, or other defect in the eyes, but it is generally the result of habit arising from bad breaking. If from the latter cause, it can usually be overcome; if from bad eyesight, never. In riding a shying horse, the first requisite is that "the rider shall not shy himself." He should not let the horse know that he is expecting him to shy, as he communicates his timidity to the animal, who loses confidence in both himself and his rider. Whilst the rider should be on his guard, he should not, by change of seat or reins, lead the animal to think something is about to happen as he approaches an object: he should ride straight ahead, apparently paying no attention to the object or the horse. If he shys or sheers from freshness, keep him in a straight line by pulling his head toward the object and giving him pressure with the leg on the opposite side. If he stops or turns around, make him go, even if you must whip him (*behind* the girths), especially if his shying be a mere pretence. If the object be really frightful, much kindness should be used, with firmness. A steady rein and plenty of "nerve" in the rider will usually overcome shying, as the horse gains confidence in himself through his confidence in his rider. He should not be *forced* to face an object which really frightens him. He may be gotten to pass it by turning his head from it, and pressing him on the side *toward* which his head is turned. If the object is moving toward the horse, it is best to turn his head toward it, stopping him, or moving gradually, until the object has passed.

Horses will often pass an object and not shy at a similar one again, if given a chance to examine it and touch it with the nose, after being gently gotten up to it. Never whip a horse for shying after he has passed the object, as he will soon acquire the habit of running after each shy, as he expects the whip.

A horse may often be made to pass an object without shying, by quietly pulling his head away from it as he begins to notice it, and thus attracting his attention to something else: he cannot think of two things at the same time.

If a horse is evidently confirmed in the habit, he is not fit to ride, and should be disposed of and put to work where he can do no harm.

Bolting.—If a horse bolts, or rushes, from control of the bit, loosen the reins a moment and give them a sudden jerk, or sharply "saw" him: that is, pull the reins alternately on either side *quickly* and *sharply*, keeping his head up.

Some authorities say that by gathering the reins so short in the left hand that it presses against the mane, and then passing the right hand down (on either side), as close as possible to the bit and pulling the horse's head quite around to one side, any bolter may be stopped. It is best to stop the horse, if possible, so soon as he starts faster than the rider wishes him to go, before he has gotten into the running stride. But if he does run, try to keep your seat; and if there is a clear road, let him go until he begins to tire, and then give him the whip until he is run out and glad to stop.

In most cases horses acquire vices through being maltreated, though some animals are vicious by nature.

The rider should seldom use his whip to punish his horse, and the spur should never be so used. But when the whip is used for punishment, it should be sharply applied two or three times. If used to make the horse go forward when backing, it should be taken in the right hand, and a sharp cut be given over to the left side, behind the saddle girths, and brought back very quickly on its rebound, and struck on the right side, behind the girths. To do this expertly requires some practice off the horse, but it is worth the time, as it does not give the pain on one side only, and cause the animal to swerve. Skilled riders advise that a contest between the horse and his rider always be avoided, if possible, by turning the horse's attention to something else. Never strike on the shoulder, as the horse naturally draws back, or swerves, from the blow.

A bad rider sometimes punishes his horse for not understanding what he is wanted to do, when the fault is with the rider himself, who either does not know how to make his desire known or does not do so clearly. A well-trained horse is always willing to obey, and does so the moment he understands. To punish him for not understanding is usually one step toward making him vicious. Authorities differ much on the subject of training horses, but it is safest to err on the side of kindness. A rider who does not lose his temper has a great advantage. A nervous horse with high courage may be a perfect saddle horse in the hands of a self-controlled rider, and useless in those of a cruel, loud-voiced one.

In country-road riding, always pick the softest paths; and if the road be macadamized, ride on the edges. Ride slowly on descents, with shoulders back, and walk your horse down hills.

Pulling.—Many horses pull, when first leaving the stable, from lack of work, and soon calm down. Some horses of a nervous disposition pull through anxiety to go ahead: such animals can be ridden with comfort only through gentle treatment and light hands. Often they will not pull *unless pulled by the driver.* Easy bits, such as a snaffle, bar, either rubber covered, should be used alternately, every few days. Horses with low, heavy shoulders, carrying low heads, are apt to pull, and are not fit for saddle use. If a horse with a good mouth begins to pull and bear down upon the bit, it will often be found that his feet are becoming contracted or "sore," or that he is stiff in his front legs. This bearing upon the bit is an effort to transfer a part of his weight. A good veterinary should be consulted in such a case.

Hands.—A rider is said to have "bad hands," when he continually pulls at his horse's mouth. "Good hands," or "light hands," seem to be natural with some riders, and almost impossible to cultivate in others. Women oftener have good hands than men, perhaps because they are not as strong and are more sensitive. Often a woman can ride with ease a high-strung, nervous horse, which may be a puller, or even a runaway, under a rough-riding man. The rider must learn to "give and take" with the reins. If the horse pulls, use force enough to bring him to the pace required, aided by a kindly and quietly spoken word, like "there," or "walk" (but not "whoa," which should always mean stop), and then gradually loosen the reins. Always hold the reins tightly in the hands, whether pulling or not.

Unless great force is required, hold the forearms at right angles to the body, with the hands downward at the wrist, as in playing a piano. It will be found that there is strength enough at the wrists for the control of most horses—certainly for well-broken ones—and that the hands will grow "light" as they "give and take" from the wrist with the motion of the horse's head whilst in action. If a horse bears down upon the bit, his head may be brought up by raising the hands and moving the snaffle reins sharply and quickly from side to side; or, if he is persistent, by raising either hand with a sharp pull upward, ten or twelve inches.

If the tendency of the horse is to carry his head too low, carry the hands somewhat high. If he has the opposite tendency, carry the hands low.

Spurs.—No beginner should wear spurs: they are a source of danger, except when worn by experienced horsemen, and no rider who turns his toes outward should put them on.

Stumbling.—A stumbling horse should never be ridden. The fault may arise from some curable disease of the feet, but is usually from weak knees or legs. If mounted on a stumbler, keep his head up and make him move at a lively pace by aid of whip or spur.

Bits.—Most horses go well with the double bit; that is, the curb and snaffle or bridoon. But some horses, with very tender mouths or nervous dispositions, go better with the snaffle alone: it may be used with two reins, but without the extra headpiece. A few horses go well with the curb, but dislike the additional mouthpiece of the snaffle. For these the Pelham bit may be used.

Riding Hints to Girls.—A girl should not ride every day, and long, until she is sixteen, unless she has a second saddle with the pommels on the right side, to enable her to sit on different sides of the horse on alternate days. In very young girls the muscles are weak, and the spine and shoulders may grow crooked. No girl ought to ride unless she likes to and is fearless. A horse quickly knows if his rider is afraid, and soon becomes master. A woman's saddle should have a *flat* seat, and the stirrup should be perfectly plain. Riding should be practiced without using the stirrup: it gives great confidence, balance, and freedom. Of course it is not intended to recommend long rides without a stirrup; but only practice during exercise in the school or at some safe spot. The rise to the trot can be done without it, and should not depend too much upon it: by grasping the upright head firmly with the right leg and pressing the left knee against the leaping-head, or lower pommel, the rise can be accomplished with the slightest aid from the stirrup, and in fact should be so ridden.

To make the horse canter, leading with his right leg, pull his head slightly to the left with the left rein, and press him quickly with the left heel. To make him lead with the left foot pull the right rein and tap him with the whip, behind the the girths, on the right side, where the heel would touch him if on that side.

A woman or girl, in mounting, should place her right hand on the upright head, and her left foot in the left hand of an assistant, held about sixteen inches from the ground. She places her left hand on his right shoulder, and his right hand is under her left armpit. The assistant counts one, two, three. At three, she springs upward, the assistant aiding her by rising. Being on the saddle, she places her right knee over the upright head. The assistant sees that her left foot is placed in the stirrup and fastens the elastic straps for holding the skirt in place. In dismounting, after first releasing the right leg and the dress from the pommel, and turning from the forward position, she holds her arms at her sides and simply slips off the horse, her assistant placing a hand under each elbow, thus bringing her down lightly. Women should keep shoulders and hips squarely to the front, looking straight between the horse's ears. The right leg above the knee lies flat on the saddle, while the right knee grasps the upright-head firmly. Below the knee the leg is drawn back, and the toes are bent downward. The left knee is close to the saddle, and the leg below the knee hangs easily down. The foot in the stirrup is held parallel to the horse's side.

The rules of the road in riding are the same as in driving, and should be followed very carefully, both in the park and on the road.

OUTDOOR RECREATIONS

Rowing

By J. D. CHAMPLIN and A. E. BOSTWICK

THE art of propelling a boat by means of oars. The oarsman sits upright on the thwart, or stationary seat, with his feet against the stretcher, which should be at such a distance that the knees will be bent, but so that the hands will easily clear them. The knees are held about a foot apart, the heels close together, and the toes turned out. The handle of the oar is grasped naturally with both hands, one, called the inside hand, at the extreme end, the other, or outside hand, from one-and-a-half to two inches from it. The thumbs are usually underneath, though some rowers hold the thumb of either the inside or outside hand above the oar. The rower begins by inclining the body forward, keeping the back straight and the head erect, and stretching out his arms as far as possible. The oar is now dropped into the water (called the "catch"), and the rower begins to pull at the same time. He should avoid both pulling before the oar strikes the water and waiting for an instant afterward. Some oarsmen hold the blade of the oar at right angles to the water as they dip it, and others incline the front of the blade a little forward. The blade of the oar should be dipped just enough to cover it, and it should be kept at the same depth during the stroke.

The learner should avoid pulling the blade of the oar through the air before it strikes the water, as is the usual way with beginners. The result of this fault is called "clipping," or in other words it makes the stroke short. The power should be applied the moment the oar touches the water. The blade should be dipped sufficiently deep to avoid its slipping through the water, as is the case with what is known as "surface dipping." In stretching out the arms they precede the movement of the body, both going forward together, but the hands moving faster than the body.

After pulling steadily, using the back and legs as well as the arms, the stroke is finished when the body is slightly inclined backward and the knees nearly straight. The oar is then lifted from the water, and the body brought back to the first position ready to begin another stroke. This is called the "recover," and was formerly often executed with a sudden movement so as to waste as little time as possible. But oarsmen now favor a slower recover, to avoid straining the muscles of the abdomen, which are used in the movement. It has been said that the recover is really the most fatiguing part of the stroke. The hands should move forward a little faster than the body. But others make the movement with the arms first, lest they should cramp the body. At the instant the body has reached the proper position, the oar is dropped into the water and the second stroke begun. If an oarsman wait an instant before "catching," he is said to "hang," and he should equally avoid catching before he has finished going forward, thus splashing water. The oar should be carried as low as possible during the recover, the height depending on whether the water is rough or smooth. When the beginner has learned these movements so that he can execute them without looking at his oar, which should never be done by the finished oarsman, he should "feather" on the recover. Feathering is turning the blade of the oar parallel with the surface of the water during the recover, so that the resistance of the air will be as little as possible. To feather properly, the wrist of the inside hand should be curved a little upward during the stroke and at its close; just as the oar is lifted out of the water, the wrist is lowered and the back of the hand thrown a little upward, so as to turn the oar blade through a right angle. Just before the catch, the movement is reversed, so that the oar is ready to take the water again. As to the rapidity of the stroke, opinions differ, but most oarsmen prefer a long and steady stroke, though some of the most successful racing crews have pulled very rapidly. The rate of stroke is determined to a great extent by the length of the race, being faster for short races. A rapid stroke is exhausting and cannot be kept up long, and it is also difficult to execute the stroke properly if it is very swift. The oarsman should keep exact time with the others in the boat. To "back water," or cause the boat to move in the opposite direction, the oarsman reverses his oar and pushes instead of pulling. The movement is made principally by the arms, the body resting in a natural position. If he is pulling a pair of sculls, the same rules apply, except that each oar is pulled by one hand. By holding the oars firmly, and in exactly the same manner, the oarsman may be sure that the catch and feather are made at the proper angles without looking to see. The oarsman should be careful to pull both sculls with the same force, otherwise the boat will turn toward the weaker side. If he has no one to steer, he should bring some point in the stern of the boat into line with a tree or other object on shore, and then keep them in line. If the stern swerves toward the left, for instance, he must pull a little harder on his right scull to bring it back again. If he wishes to turn quickly he must back water with the oar on the side toward which he wishes to turn, and row with the other. Where several row in one boat, the steering is often done by the bow oar. Where the boat is steered with a rudder, the rudder is managed either by the bow oar, who operates it with his feet, by an arrangement of cords and levers, or by a coxswain, who sits in the stern, and who also gives the necessary orders to the oarsmen, telling them when to begin to row and when to stop rowing. He does this because he is the only one in the boat who faces in the direction of motion. The rules to be observed by the steersman, whether he be coxswain or one of the oarsmen, are generally as follows: "Inside" means toward the shore, "outside" toward the middle of the stream.

1. Boats going with the stream or tide take the outside, and those against stream or tide the inside.

2. Boats meeting keep to the right.

ROWING.

3. A boat overtaking another must keep clear of it.

4. A boat with a coxswain must yield as far as possible to one without a coxswain.

5. A rowboat must give way to a sailboat.

6. A boat with a less number of oars must give way to one with a greater number.

Sliding Seats.—Almost all racing boats now use sliding seats, which add greatly to the power of the oarsman, enabling him to use the muscles of his legs in pulling. Other advantages are the fact that the body does not need to be bent forward or backward, to a position where the muscles of the back cannot be used to advantage, as in ordinary rowing; the prevention of cramp by the alternate bending and stretching of the leg, and the ability to maintain a better pace for a longer time. In a quick "spurt" the sliding seat is thought by some oarsmen to be a disadvantage, as it gains power at the expense of velocity; but some of the best authorities do not agree with this conclusion. The seats either slide on a sort of brass rails, or roll on little steel balls, the object being to make the friction as small as possible.

When the oarsman uses a sliding seat, the body begins to swing first, and then he pushes the seat back, both movements blending together until the legs are almost straight. The swing of the body and the slide together determine the length of the stroke. The slide should not be made too soon, and for a beginner should be only a few inches, being increased as the oarsman becomes more expert.

The oar, in rowing, acts as a lever. The principle is the same as when a weight is lifted by the middle of a stick, the end resting on the ground. In the case of the oar, the end rests in the water instead of on the ground, and the boat is "prized" along, so to speak, by the oarsman. The blade of the oar does not remain perfectly still, like the end of the stick on the ground, but moves through the water a little, so that some power is lost. It is evident that the oar should be held so that the water will resist its motion as much as possible.

The action of the rudder is as follows: if the boat is moving straight ahead, and the rudder is in line with it, there will be no pressure from the water on either side; but as soon as the rudder is turned, for instance, to the right, the water will press on its right side and push the stern of the boat over toward the left, which will alter the boat's direction toward the right. In the same way, turning the rudder toward the left causes the boat to turn to the left. Hence the rudder must always be turned in the direction the boat is to go. In a rowboat the rudder is usually managed by means of cords, one of which is attached to each end of a crosspiece at its top. The power should be applied to the rudder lines steadily, so as not to throw the boat to one side or the other, as is the case if the line is pulled quickly and then relaxed.

The following are the rowing rules of the National Association of Amateur Oarsmen, adopted also by the National Amateur Athletic Union:—

1. All boat races shall be started in the following manner: The starter, on being satisfied that the competitors are ready, shall give the signal to start.

2. If the starter considers the start false, he shall at once recall the boats to their stations; and any boat refusing to start again shall be disqualified.

3. Any boat not at its post at the time specified shall be liable to be disqualified by the umpire.

4. The umpire may act as starter if he thinks fit; where he does not so act, the starter shall be subject to the control of the umpire.

5. Boats shall be started by their sterns, and shall have completed the course when the bows reach the finish.

6. A boat's own water is its straight course, parallel with those of the other competing boats, from the station assigned to it at the start to the finish.

7. Each boat shall keep its own water through the race, and any boat departing from its own water will do so at its peril.

8. The umpire shall be sole judge of a boat's own water and proper course during the race.

9. It shall be considered a foul when, after the race has commenced, any competitor, by his oar, boat, or person, comes in contact with the oar, boat, or person of another competitor;

unless, in the opinion of the umpire, such contact is so slight as not to influence the race.

10. No fouling whatever shall be allowed; the boat committing a foul shall be disqualified.

11. The umpire may, during a race, caution any competitor when in danger of committing a foul.

12. The umpire shall decide all questions as to a foul.

13. A claim of foul must be made to the umpire by the competitor himself, and, if possible, before getting out of his boat.

14. In case of a foul, the umpire shall have the power—(*a*) to place the boats (except the boat committing the foul, which is disqualified) in the order in which they come in; (*b*) to order the boats engaged in the race, other than the boat committing the foul, to row over again on the same or another day; (*c*) to restart the qualified boats from the place where the foul was committed.

15. Every boat shall abide by its accidents, except when, during a race, a boat while in its own water shall be interfered with by any outside boat, the umpire may order the race to be rowed over, if, in his opinion, such interference materially affected its chances of winning the race.

16. No boat shall be allowed to accompany a competitor for the purpose of directing his course or affording him other assistance. The boat receiving such direction or assistance shall be disqualified at the discretion of the umpire.

17. The jurisdiction of the umpire extends over the race and all matters connected with it, from the time the race is specified to start until its final termination, and his decision in all cases shall be final and without appeal.

18. The judge at the finish shall report to the umpire the order in which the competing boats cross the line, but the decision of the race shall rest with, and be declared by, the umpire.

19. Any competitor refusing to abide by the decision, or to follow the directions of the umpire, shall be disqualified.

20. The umpire, if he thinks proper, may reserve his decision, provided that in every case such decision be given on the day of the race.

21. Contestants rowing a dead heat shall compete again, after such interval as may be appointed, and the contestant refusing to so row shall be adjudged to have lost the race.

22. In turning races, each competitor shall have a separate turning stake, and shall turn from port to starboard. Any competitor may turn any stake other than his own, but does so at his peril.

OUTDOOR RECREATIONS

Sailing

By J. D. CHAMPLIN and A. E. BOSTWICK

THE hulls of boats are of various sizes and shapes, but all have the forward end (called the bow) sharp, that it may cut through the water. The after end, called the stern, is fitted with a rudder, with which the boat is steered. This rudder is the same in principle as that of a rowboat, and is managed by means of a handle or lever, called a tiller; when this is pushed to one side, the rudder turns to the opposite side; and as the boat turns to the same side as the rudder, the tiller must be moved to the side opposite to that in which the steersman wishes the boat to go. The right-hand side of the boat, as one faces the bow, is called the starboard side, and the left-hand the port side (formerly called larboard). To "port the helm," or "put the helm to port," means to push the tiller toward the port or left side, thus turning the boat to the starboard or right. Large boats are generally steered with an upright wheel connected with the rudder by ropes, cogs, or otherwise. Small boats are sometimes entirely open, but generally half decked, and larger ones usually have a covered cabin. The bottom of a boat's hull, called the floor, may be almost flat, or it may be more or less curved. The depth of a boat below the water's surface is called her "draught." If this distance is two feet, for example, she is said to "draw two feet of water." Of course, the draught is greater if the boat be loaded. The difference of draught between the bow and stern of a boat is sometimes called the drag. It is the best plan to ballast or "trim" small boats so that the stern sinks a little deeper than the bow.

Cutters draw a great deal of water, and are narrow and sharp at the bottom. This kind of boat is much liked in England. Most American yachts are broader and draw less water, and one kind of boat, the sharpy, is almost flat bottomed. Some sailboats have a keel, or ridge of wood, running from bow to stern on the outside of the hull at its bottom, and others have a centerboard—a flat board which is let down at one end through a slit in the middle of the boat. Still others, generally small boats, have a leeboard, which is let down at one side. All these devices are meant to prevent the boat from drifting sidewise, so that she will move most easily forward. Sailboats usually have rowlocks at the side, so that they can be rowed when there is no wind.

The arrangement of masts and sails constitutes the "rig" of a boat. The area of the sail in an ordinary boat should not much exceed the length of the boat multiplied by its extreme breadth. In most boats the sails are hung to spars or poles, which are raised and lowered on the mast by ropes called halyards. If the spar hangs across the mast, it is called a yard, and the vessel is said to be square rigged; but only large craft, like ships and brigs, are rigged in this way. Pleasure boats are generally fore-and-aft rigged; that is, the spars are fastened to the mast by one end, and the sail is therefore all on one side of the mast. The bottom of the sail is fastened to a longer pole, called a boom. In all boats the rope by which the sail is controlled is called the sheet.

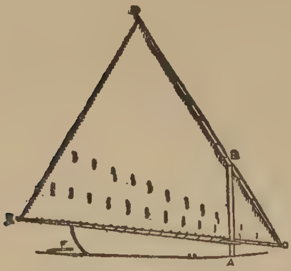
One of the simplest rigs is the spritsail, which is nearly square. There is no boom, and in place of the gaff a light pole, called a sprit, fastened at the lower end, or "foot," to the middle of the mast, and at the other end to the upper corner of the sail. The side of the sail toward the mast (called the luff of the sail) is laced to it with cords, and the foot of the sprit rests in a loop of rope. When the foot is taken from the loop, the sail can be folded up against the mast and tied to it. The mast is usually made, in this case, so that it can be taken down or "unstepped" and laid in the bottom of the boat. The sheet is fastened to the lower outer corner of the sail. Such a sail may be used on an ordinary rowboat, or on a canoe.

Another simple rig is the "leg-of-mutton," a triangular spritsail, having its sprit nearly at right angles with the mast, and therefore taking the place of a boom rather than of a gaff. The mast used with a sprit, or leg-of-mutton, sail is sometimes made so that it can be unstepped by the boatman without his leaving his seat. Another simple rig is the balance-lug, much used by fishermen on their craft.

The most common rig for ordinary sailboats is the cat-rig, and boats thus rigged are called catboats. The sail, which is like an ordinary mainsail, with gaff and boom, is hoisted to its place by halyards, of which there are usually two, one to raise the outer end of the sail (called the peak), and one the inner corner (called the throat). The sheet is fastened to the boom. The sail, which slides up and down the mast by means of hoops or rings, is generally fitted with two or three rows of short ropes called reefing-points, by which its size may be lessened in case the wind blows strong. This is done by letting down the sail and tying one or more of these rows of ropes on one side of the sail to corresponding ropes on the other side. When the lower row is thus tied, the sail is said to be single-reefed; and when the second row is used, double-reefed. Catboats are usually broad, draw but little water, and have centerboards. As they have but one sail, they are more easily managed and safer than other boats, and are therefore the best kind for boys.

The sloop-rig differs from the cat-rig in having a jib in addition to a mainsail. The mast is set a little farther aft, to make room for a bowsprit, a spar projecting from the bow, with a rope called a stay extending from its end to the top of the mast. On this stay the jib, which is fitted with rings on one end, is pulled up and down by means of the jib halyards. Sometimes more than one jib is used, in which case the others are called the jib topsail and flying jib. Sometimes in a light breeze a large jib, called a balloon jib, is used. The jibs are also called headsails. Sometimes a spar called a jib boom is fastened to the end of the bowsprit and projects beyond it, when many headsails are carried. In addition to the mainsail, sloops often carry above it a topsail, called, from its position above the gaff, a gaff-topsail, and in light winds another triangular one called a spinnaker, fastened to the mast and spread at the foot by a boom.

The yawl, in addition to the sloop-rig, has a "jigger," or small mast, at the stern. The boom of the mainsail is short, to make room for this new mast. As has been said, the English sloops called cutters are narrow and draw a great deal of water. To keep them upright in the water they are loaded with lead at the keel, sometimes with many tons' weight. This is called outside ballast. Nearly all boats are obliged to carry ballast of some sort, but it is generally inside ballast; that is, it is placed in the bottom of the boat. It usually consists of pieces of iron or lead, or bags of gravel or sand. Ballast helps to prevent capsizing, and permits the boat to carry more sail. In small boats it is often shifted from one side to the other in tacking, which is fully explained below. All cutters have keels, but the ordinary American sloop may have either a keel or a centerboard.



Lateen.

Cutters may have a deep cabin entirely below the deck, but in the centerboard sloop part of the deck must be raised to give the necessary depth beneath it, and in catboats, except large ones, there is no room for any cabin at all. The catboat is decked at the bow and stern and around the sides, having an open space in the middle called the cock-pit.

A narrow, flat-bottomed boat, called a sharpy, is much used on Long Island Sound and about New York, and a similar craft, called a pound boat, is popular on the great lakes. There are one or two masts, usually with a leg-of-mutton sail, though the pound boat has two sails, like a small sloop's mainsail. Large sharpies, with jibs and a small mast in the stern, are called Roslyn yawls, after the home of the designer, Thomas Clapham, of Roslyn, Long Island. The lateen rig, which is shown in the illustration, is mainsail and jib in one. It is not much used except on small boats like canoes. The kind of sailboat used, and its rig, depend much on the water in which it is to sail. A

YACHTING

From a Painting by R. Jourdain.

boat for use on smooth and sheltered water would not be appropriate for the open sea, and *vice versa*. For rivers and small lakes, a boat of wide beam and light draught is needed, with a small sail, on account of the sudden flaws of wind common on such waters. The sail may be a leg-of-mutton, a balance-lug, or something similar. For bays and arms of the sea, a larger boat of greater draught is proper, with a mainsail, or jib and mainsail.

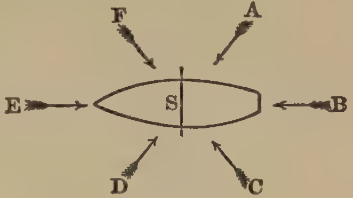


Fig. 1.

A vessel like a raft, which can move in any direction on the water, will always drift before the wind, but if the vessel have a keel, or a centerboard, so that it moves most easily in one line, it will move chiefly in that line, no matter in what direction the wind is blowing. If the boat could not drift at all sidewise, it would not move at all if the wind were at right angles to it. All boats drift more or less, but the object of the keel and centerboard in sailboats is to reduce the drifting as much as possible. At first we shall suppose that the boat cannot drift at all sidewise. In Figure 1 supposing a sail, S, to be set up directly across the boat; if the wind were blowing in the direction A, B, or C, the boat would move forward; if as at D, E, or F, backward, since it cannot move sidewise. Now the force of the wind always presses squarely against the sail, no matter if it is blowing at an angle. Thus, in Figure 2, if the wind is blowing with the large arrow, and the sail is turned as at A, the wind will act just as if it were blowing with the dotted arrow.

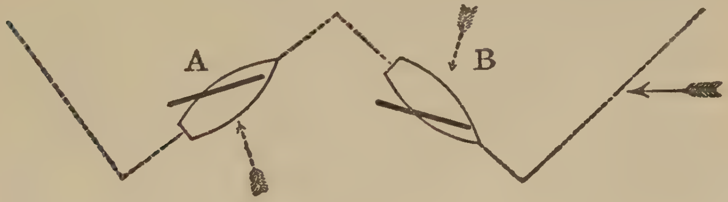


Fig. 2.

only with less force. As the boat can move only forward or backward, it will go forward, since the force is in the rear of the sail. Now, if the boat and sail be turned as at B, the effect of the same wind will be as if it blew with the second dotted arrow; the boat will move forward at another angle, and by turning to and fro, following the dotted path, it will make progress, on the whole, in the direction from which the wind is blowing. This turning from one side to another, in a zigzag path, is called tacking, or beating to windward. When a boat is headed nearly against the wind, it is said to be sailing "close to the wind." If a boat did not drift at all sidewise, it could thus sail almost directly against the wind; but drifting prevents this. The closer the course is to the wind, the more force there is to make the boat drift, and the less to move it forward.

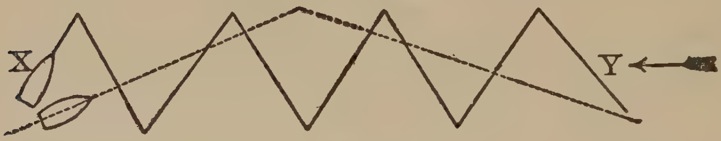


Fig. 3.

To be able to sail close to the wind is a great advantage in a boat, as will be seen from Figure 3. The boat A, which can sail closer to the wind than B, has to tack less and can follow a shorter path in going from X to Y.

When the boat tacks, the wind strikes on the opposite side of the sail, and swings the boom to the other side of the boat. The more closely to the wind the boat is sailing, the more nearly in a line with the boat the sail must be. This is arranged by hauling aft the sheet. When the boat is running before the wind, the sheet is so fastened that the sail is nearly at right angles with the boat. When the boat is headed directly toward the quarter from which the wind blows, the sail will swing directly to the rear of the mast, and the boat is said to "come to," or "heave to." In this position the only effect of the wind will be to drift the boat slowly backward. The art of managing a sailboat is best learned from one who is skilled in it. The sailor sits on the windward side of the tiller, so as to manage it better. (Windward means the direction from which the wind comes, and leeward that toward which it blows). If he is sailing to windward, he must watch the edge of the sail next the mast. If it shivers, or flaps, that is a sign that the boat is too close to the wind, and the tiller must be pulled a little to windward (called putting the helm up). This will turn the head of the boat a little farther from the wind so that the air will fill it smoothly again. When ready to tack, or "go about," he should push the helm to leeward (called putting the helm down or "a-lee"). This will turn the boat's head so that she first comes into the wind, and then, as she continues to turn, the wind will presently strike the opposite side of the sail and it swings across the boat, which then starts away on the other tack. The helm must be pushed down gently that the boat's headway may not be stopped, and the sail will swing over easily. The learner should not try to sail too close to the wind, nor have his sail "trimmed too flat," that is, too much in line with the boat. In sailing to leeward, the helmsman watches the outer edge of the sail (called the leech). If it begins to flap, he should either let the sail out farther by "paying out" the sheet, or put up the helm. In sailing to leeward, if the course requires the sail to be swung over from one side to the other, it is most safely done by turning the boat quite around, so that the boat is close to the wind as the sail swings, just as in tacking. Another way is by "gybing," which is done by hauling in the sail slowly, and at the same time putting the helm up till the sail is perfectly flat, then letting out the sheet and allowing the sail to swing out on the other side. The object is to prevent the wind's catching the forward side of the sail suddenly and blowing it over quickly, which might capsize the boat. Gybing is dangerous, because the sail swings over so violently that it is apt to carry away the rigging or capsize the boat. It should be avoided if the wind is blowing hard, and it is more safe to loosen, or "ease off," the peak halyards a little first. Care must be taken that the boat does not gybe by accident, when sailing before the wind. A change in the course, without letting out the sail so as to keep the wind at its rear; or the dipping of the boom into the water so as to swing it back, may have this result. When the wind is blowing fresh, the sail is often reefed, as explained above. When a sail is to be reefed, it has to be lowered before tying the reefing points. If the wind blows very hard, the boat should be brought into the wind, and sometimes it may be necessary to lower the sail. In reefing, the points of a second or third reef should never be tied till those of the preceding ones are secured. This is to enable the sailor to let out the reefs one by one, as soon as the boat is able to carry more sail.

In making a landing, the boat's head is always brought into the wind, and the boatman must therefore land on one side or another of the dock, according to the direction of the wind.

Six Rules to Follow

When sailing among other craft, the following rules, which are universally observed, must be borne in mind;

1. Boats on the port tack must keep clear of those sailing on the starboard tack. In all cases of doubt, the boat on the port tack must give way.

2. Boats sailing before the wind must give way to those going on either tack.

3. In case two boats are sailing before the wind, the one having the wind on the port side must keep out of the other's way. The side on which the boom is, settles the question as to direction of wind.

4. If both have the wind on the port side, the windwardmost must give way. But in any event the overtaking boat must keep clear of the one it is overtaking.

5. If two boats meet, both must put their helms to port.

6. In a race, if two boats approach a shore or buoy, and the one to leeward has not room to tack so as to clear the other, and yet would be in danger by keeping on her course, she must hail the other, which must tack at once. The leeward boat must tack as soon as there is room to do so.

Nautical Terms

In ordinary conversation, these should generally be pronounced as spelled, but sailors have their own pronunciation (indicated in parenthesis), which is commonly used on board a boat.

Abaft.—Toward the stern.

About, To go.—To go on the other tack.

Beam.—The greatest width of the boat.

Beating.—Tacking to windward.

Belay.—To fasten a rope to a cleat by winding or twisting it around.

Bend.—To fasten, as a sail or rope, to a boom or yard.

Bobstay.—A rope extending from the end of the bowsprit diagonally downward to the cutwater.

Boom.—A spar to keep the foot of a sail stretched. The word is the same as beam.

Brails.—Ropes to assist in furling sails. From the old French *bracieul*, a leather breeches-band.

Broach to.—To come up quickly into the wind when running before a heavy sea.

Cat's Paws.—Little puffs of wind.

Clews.—The lower corners of sails.

Cockpit.—The place where the passengers sit in a partly decked boat.

Combing.—The raised board surrounding the cockpit.

Closehauled.—Sailing as close as possible to the wind.

Close to the wind.—Nearly in the direction from which the wind is blowing.

Crank.—Easy to overturn, opposed to *stiff.*

Cringle.—A loop of rope, either plain, or made around an iron ring, and attached to a sail. Cringle means a ring.

Down, To put the helm.—To push the tiller to leeward.

Downhaul.—A rope to pull down a sail.

Draught of water.—The depth of the lowest part of the boat beneath the surface of the water.

Foot.—The lower edge of a sail.

Fore.—Forward.

Fore-and-aft.—Lengthwise of the boat.

Foremast.—The forward mast of vessels having more than one mast.

Foresail (fóre-s'l).—The principal sail on the foremast of a fore-and-aft rigged vessel.

Furl.—To fold a sail and lash it to the boom or mast.

Gaff.—The spar to which the upper part of a fore-and-aft sail is fastened. From the French *gaffe*, a long pole with a hook, used in fishing.

Gasket.—A rope for lashing a furled sail to the spar or mast. From the French *garcette.*

Grapnel.—A small anchor having several claws.

Grommet.—A ring of rope or metal. Derived from the French *gourmette*, curb chain.

Gunwale (gún-nel).—The topmost board or plank that forms the side of a boat.

Gybe.—To swing the boom from one side to the other, while sailing before the wind.

Halyard.—A rope for hoisting a sail. Derived from haul and yard.

Hawser.—A large rope. From the German, *haltseil*, hold rope.

Hawse-hole or *Hawse-pipe.*—A hole through which passes the hawser or chain that holds the anchor.

Head.—The top of a sail.

Helm.—The steering apparatus. From the Anglo-Saxon, *helma*, rudder.

Hoist.—The part of a fore-and-aft sail that slides up and down the mast.

Jibs.—Triangular sails set on ropes reaching from the foremast to the bowsprit.

Jibboom.—A spar extending from the end of the bowsprit.

Jigger.—The small mast in the stern of a yawl, also called the mizzen.

Keel.—A timber running from bow to stern at the bottom of the boat. From the Anglo-Saxon *ceol.*

Keelson (kél-son).—A timber running over the keel above the floor-timbers.

Knot.—A nautical mile (in the United States 6,080¼ feet), so called because it is the distance between two knots on the log line, by which distances at sea are measured.

Larboard (lár-burd).—The left-hand side of a vessel (looking forward) now generally replaced by the word "port," to avoid confusion with "starboard." It is probably contracted from *lower board,* because the left side was considered inferior in rank.

Lee, or *Leeward* (loó-ard).—The side toward which the wind blows, originally a place sheltered from the wind. From the Anglo-Saxon *hleo,* a shelter.

Leech.—The after-edge of a fore-and-aft sail. Probably from the Latin *licium,* a thread.

Luff.—The forward edge of a sail. To luff, or luff up, is to steer close to the wind. Luff may be from the German *luft,* air.

Mainmast.—The principal or largest mast.

Mainsail (máin-s'l).—The large sail of a catboat or sloop.

Miss stays.—To fail in trying to tack.

Mizzenmast.—The aftermast in three-masted vessels.

Off.—Away from the point from which the wind blows, as in "Keep her head off."

Peak.—The point of the sail at the outer end of the gaff.

Port.—The left-hand side of a boat looking forward (see *Larboard*).

Rake.—Inclination, as "the rake of a mast," "a raking sternpost." Masts are usually given a rake aft to bring their weight and that of sails and rigging farther aft. The word is from the Anglo-Saxon *raecan,* to reach.

Ratlines.—Ropes fastened across the shrouds, making ladders by which the sailors in large vessels can climb to the masts.

Reef.—To fold part of the sail and fasten it together in order to lessen the surface exposed to the wind. The folded part of the sail is called also the reef. From the Anglo-Saxon *reaf,* a garment.

Rig.—The arrangement of masts, sails, and ropes in a boat. From the Anglo-Saxon *wrigan,* to cover.

Rigging.—The ropes of a boat, divided into standing rigging, the rope used to strengthen the masts, and running rigging, the ropes used to work the sails.

Serve.—To wind yarn or cloth around a rope's end to prevent its raveling, or around any part to keep it from wearing away by rubbing.

Sheet.—A rope fastened to the lower outer corner of a sail or to the boom, to haul it in and keep it in place. From the Anglo-Saxon *sceotan,* to cast or extend.

Shrouds.—In large vessels, ropes extending from the head of the lower mast to strong timbers at the sides of the vessel. They serve to strengthen the masts. See *ratline.*

Slack.—Applied to a boat with a tendency to turn her bow from the wind, owing to improper construction.

Spar.—A general term for masts, yards, booms, gaffs, and the like.

Spinnaker.—A large triangular sail used by sloops in a light wind.

Splice.—To fasten the ends of two ropes by interlacing the strands. It is nearly the same word as "split," the strand being pulled apart.

Sprit.—A light spar, extending from the middle of the mast to the outer corner of the sail, used in place of a gaff. From the Anglo-Saxon *spreot,* a spear or pike.

Starboard (stár-burd).—The right-hand side of a boat (looking forward). From the Anglo-Saxon *steoran,* to steer, and *bord,* a border.

Stay.—A rope to steady a mast, extending diagonally forward from its top. Stays also extend between the masts and from the upper masts to the sides.

Staysail (stay-s'l).—A sail spread on a stay

Stem.—The upright timber at the end of a vessel's bow to which the ends of the planking are fastened.

Stern.—The rear end of a boat. From the Anglo-Saxon *stearn,* a helm, because the helm is placed there.

Stiff.—Keeping upright, opposed to crank; a boat is stiff when the wind makes her incline very little. Applied to a wind or breeze, stiff means strong.

Tack.—The lower fore-corner of a fore-and-aft sail, or a rope attached to that corner; also the direction of a boat when sailing to windward. A boat is on the starboard tack when the wind is on the starboard side; on the port tack when the wind blows against the port side. A boat is said to tack in changing from one tack to another. Tack means to fasten. The first meaning is the original one, the other being derived from it, as the tack holds the corner of the sail when the wind crosses it obliquely.

Taut.—Tight.

Tarpaulin.—Tarred canvas, from tar, and *pauling*, provincial English for the covering of a cart.

Topsail.—The second sail above the deck.

Tiller.—The rudder handle; from the provincial English *tiller*, the handle of anything.

Trysail (try-s'l).—A small fore-and-aft sail.

Throat.—The inner concave end of the gaff or boom, which fits around the mast.

Topping-lift.—A rope to hold the end of the boom clear of the cabin, in a large boat.

Up, To put the helm.—To put the tiller to windward.

Vangs.—Ropes to steady the gaff in a large boat, running from its peak to the sides of the boat. From the Dutch *vangen*, to seize.

Wear.—To turn the boat so that the wind will be on the other side, without tacking, the bow being turned away from the wind, and the sail jibed over.

Weather.—Windward, toward the wind.

Weather-helm.—A boat is said to have a weather-helm when the tiller must be kept to the weather-side.

Wind.—The direction from which the wind is blowing; used in "bringing a boat's head into the wind," "turning her head out of the wind," "toward the wind," "away from the wind," etc.

Windward.—The direction from which the wind blows.

Yaw.—To go out of the proper course. From the provincial German, *gageln*, to totter or shake.

OUTDOOR RECREATIONS

Singlestick

By ALFRED HUTTON

THIS weapon, as we know it nowadays, is nothing more than a substitute for the light fencing saber.

The old style of "cudgeling" is now quite extinct, and the "singlestick" of to-day is mainly a medium for learning the management of the light saber as it appears in our modern fencing rooms. When "on guard," the weapon should be held in such a position as is at once the most secure for defence and the most handy for attack, being also the least fatiguing to the sword arm; and it is clear that this position is either the "medium," or the "resting medium," in which latter the hand is lowered a little to allow the pommel to rest on the thigh.

The "cuts" are six in number—two diagonally downward at the head or shoulders, two diagonally upward at the legs, and two horizontal at the belly and ribs; but in all well-regulated schools of arms the blow at the inside of the leg is strictly forbidden, on account of its serious consequences; the thrusts are usually delivered with the hand in "pronation." In defence recourse should be had to the parries of foil play, in which the pupil ought to be well trained before he is allowed to take a stick in his hand at all; thus "Quarte," with its high and low variations, covers everything on the inside, from the top of the head to the hip, and the lower line is protected by "Septime," while all the outside is covered similarly by "Tierce" and "Seconde."

Care should be taken to train the pupil in riposting smartly the instant he has stopped the attack with his parry; from the

"Quarte" the best ripostes are over the stick at the right cheek or shoulder, or under it at the right side or leg; and last, but not least, the point, in this case with the hand in "supination." From "Septime" point in "supination," or give a drawing cut at the outside of the leg by reversing the hand, which, if quickly done, is almost impossible to avoid; the repostes from "Tierce" are a cut over the stick at the left cheek, under it at the left side, or belly, and the point in pronation, while from seconde the cut should be given at the right cheek, or the point should be delivered over the enemy's stick with the hand in pronation.

OUTDOOR RECREATIONS

Some Facts and a Few Fancies on Ice

By C. BOWYER VAUX *

I CAN remember very distinctly when I learned to read, and the first book that I read through from title page to "The End." That job took a long time, and a great amount of close study; and the supreme satisfaction that I felt when the book was finally conquered was so complete, that I did not care to lessen it by another trial for a long time. I used to hate children that learned to read at an early age, unless I could catch them out of doors and show them some things that I could do and they could not—even if I was stupid at books. I must have been at least ten years old before I could read, or did read for my own amusement and instruction; but when I learned to skate I cannot remember. It was before or during my fifth year. I learned to swim about the same time I began to read a little, but I could row a boat years before that. My mother explains the fact of my not knowing how to read till quite late in life, comparatively, by stating that when I was very young I was so clever, and accumulated ideas so rapidly, that she was worried for fear my brain would be affected, and, therefore, encouraged all outdoor occupations; but, then, I was her first child, which, perhaps, will explain the situation. Her ideas have not been justified by my career thus far.

A very active circulation, perfect breath, short and strong legs, sound ankles, and a love of open-air exercise made the difficulties of skating very fascinating to me, and most of them

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were easily conquered. Although dressed lightly I rarely felt cold, and never got tired, not even after a whole Saturday on the ice without sitting down once; it was my rule never to rest while off for a skate. I had no fear of falling, as there was such a short distance to go a serious hurt was out of the question. Therefore, in trying a new figure I went at it heart, soul, and legs, and never allowed tumbles to affect me in the least, and I got many of them—especially when working on the outside edge figures, in which a slip or false step results surely in a roll over, as there is no way of saving one's self. When falling the one thought always was, "Save your head, sonny." Hit any other part of the body and you may get a sore spot—nearly all the bones have cushions of flesh over them—but give the skull a hard rap and you are done for, at least for a time.

I never yet broke anything skating (either bones or the record) except the ice. Every schoolboy has "got in" at some time or other of his skating career. Early in the winter, perhaps, after the first hard freeze, the ice on the ponds will be thin, but very tough. Then is the time when the daring ones skate over ice that heaves up and down in big waves, and finally becomes what all boys call "pompy." The ice gets cracked in every direction, and some one is sure to get a ducking if the sport is kept up. More than once have I trudged home of a cold day, after breaking through, with clothes frozen so stiff that they would stand up of themselves when taken off. Being a light weight, the boys would always send me ahead to try the new ice, after stones had been thrown on it and failed to go through. Sprawled out on all fours I would crawl over the thin ice, and, if it did not crack too much, I would gradually get up on my feet and skim about, daring the heavier weights to "come on." We never played fast and loose on "pompy" ice over deep water, but always on shallow ponds, or the upper ends of mill dams, where the worst that could happen was a wetting.

In the country the snow comes and spoils the skating, except on ponds and rivers where the ice harvesters clear it off and cut openings, which soon freeze over and make good skating for those who seek it. The city boy looks to the park for his skating, and the city pays men to keep the ponds clear of snow. The park ponds are small, and the number of people who want to skate is large, therefore the public is not allowed on the ponds till the ice is very strong. The country boy begins his skating often three or four weeks before his city cousin has thought of it. So it has come about that the enthusiastic city skaters do not wait for the "ball to be up," but go in search of ice early to the various ice-house ponds within a few miles of town; and frequently get up evening parties, in which ladies are included.

The country boy generally has plenty of room for his skating, and, quite naturally, works for speed or figures that make a big show, like the "spread eagle," "locomotive," and one-foot dodges.

The boy who can crouch down when going at top speed, put one leg out in front of him, with the foot clear off the ice, and slide on the other foot till momentum runs down, is a great man, and his skill is envied by his companions. If the skater loses his balance while trying this trick, he quietly sits down on the ice and slides on his pants. Mothers have been known to object to their sons trying this, and have threatened to sew a sheet of tin into the trousers to save the constant patching which the acquiring of this skating feat makes necessary. There are games the country boys play on skates—shinny (or hockey), now generally called in polite society "ice polo," "Lil, Lil," or "head on," a species of fox and geese, tag, "snap the whip," and many others, all calling for fast skating, quick turning, and strong lung power. The country boy who can skate backward, cut big circles forward and backward, do the "locomotive" and "spread eagle," is a talented individual in the eyes of his companions—except in Canada, where good skating is more common than here, both on account of the longer season and the many rinks even in quite small towns.

The city skater's field is limited, and he naturally tries to do all he can in a small space, and therefore figure skating interests him. Very little has been done for years in cities to make skating popular—always excepting Canada—and now very few ladies even know how to skate! Yet it is a splendid exercise, fascinating, healthful, and the most graceful yet invented—dancing cannot compare with it. When will skating get such a lift as tobogganing has had? Soon, I hope. Last year's ice can be used, as it is on the toboggan slides, and the rink opened early in the season and kept in good condition all through it with a little care and attention. The experiment is certainly worth trying.

Why are billiards and chess such universally popular games? Perhaps this term can hardly be applied to the latter, but there is no doubt about the former. There is no end to the skill that can be acquired. The problems to be worked out are innumerable and various, and with billiards the mechanical skill has no limit. Mind and body are both brought into play. So it is with skating. Exercise and enjoyment can be got out of simple straight ahead skating. One breathes fresh air, and, if in the country, has something pleasant to look upon—for the country has many attractive features in winter, though there are people alive in this nineteenth century who cannot see them. Has any one ever mastered everything that can be done on skates? Surely not. A large negro one winter appeared on the Central Park pond and performed a feat that it is safe to say no other man in New York could then do—spread the eagle with toes together and heels out to right and left, both feet in line. He could not do many of the fancy figures then pretty generally known to the clever skaters, but no one else could get legs into the positions that he could—it was a sort of contortion act that "stumped" them all. Cook's toe spread eagle with legs straight was something that many Canadian champions who exhibited here could not master, even if they could do twirls that Cook himself had to admit were beyond him.

In trying an outside edge eight backward once the heel of my skate struck a twig and threw me out of balance. By a quick turn of body, done instinctively to save myself from a bad fall, and a double toe maneuver, I kept my feet, and got the idea for a new dance figure that I have since perfected. It is very easy to do—yet I had never seen any one else do it—and even after being shown how, to my surprise most skaters find it difficult to catch. The double grape-vine twist straight backward is another figure I stumbled into when trying something else. The head and shoulders are kept in the same position always, facing the same way. The figure is described by the feet, propelled by a turn of the hips and lower body trunk, the body turn being made a little ahead of the feet movement so that the feet are going one way when the hips have made the reverse turn. I have seen wonderful things done on the ice by experts—but thus far no one has happened on my little pet figures to my knowledge.

It is not the satisfaction of being able "to show off" that makes figure skating so attractive, but the fascination of thinking out new things, and trying to do them, that is a never-ending source of delight to the skater. Let him work out a problem alone and successfully solve it, by teaching himself to do the difficult figure gracefully and accurately, and the feeling of victory will be found to be very sweet, even if he never performs it for the amusement or instruction of others. Every such success achieved is the result of long and patient work, and frequently—incidentally of course—many falls. The more one learns, the more there seems to be to learn, for the field ever widens with each new conquest. You watch a good skater perform a simple figure—like the grapevine, for instance. He moves without apparent effort, everything follows in sequence, the motion is graceful and can be infinitely varied—yet how difficult it is to do it at first! feet, body, skates, arms, and head all seem to be in the way—in the wrong place all the time. Get the idea clearly in your head first, then communicate it to the body by constant practice, and the feet will finally perform their parts with little or no friction. In fancy skating the body generally has the most to do, the legs come next, and the feet last. The beginner always seems to have the idea that his brains should be in his feet, and he keeps his head forward and eyes riveted on his toes. This must be overcome, for the position of the body consequent on such a state of mind absolutely makes it impossible to do many very simple figures where even the motion of the head is a large factor.

The advice given by an expert to a man who had worked long and hard to acquire the knack of skating on the outside edge (without success), that most graceful of all skating performances, is to the point. He said: "Don't look at your feet; forget you have any; take a long stroke, body and head erect; put your trust in Providence and lean slightly outward as you move forward, and the swing will come to you like an inspiration"—and it did. The ordinary, straight ahead or backward skating, is done on the flat of the runner of the skate, and the *inside* edge—the edge of the right skate that is toward the left foot and that of the left skate toward the right foot. Remember this!

The old days of strap skates have gone, thank goodness—and with them the inevitable cold feet. What an improvement the "rocker" was (with its long heel screw and single heel strap, and patent buckle double toe strap) over the old-fashioned, red painted peg skate, with long curved up spiral toe iron, double ring heel strap pinching the ankle, and long single toe strap wound back and forth over the foot, after the fashion of the thong used by Orientals to hold the sandal on the foot. The old wooden top skate had a flat runner, narrow and deeply grooved. The aft end of the runner was cut off short at a sharp right angle, making skating backward very dangerous, if not quite impossible. A quick turn was also out of the question. The skates were made for long strokes straight ahead, and the sharp heel angle was used as a brake to check speed. This was done by raising the toe, and thus cutting the heel point of the skate deep into the ice, throwing fine articles like snow out to right and left in a white shower. What a habit that heel peg had of slipping out of the hole in the heel of the top boot. The skate then went flying off the foot and the skater came down with a thud, or went sliding away on one runner with the other foot flying madly in air in a vain attempt to keep the balance of the body, which was almost certain to be lost before the momentum was overcome.

The runner of the "rocker" was not grooved; it was broad and curved up toward the toe and heel, which were both rounded off and projected beyond the shoes. With this skate it was possible to make a quick turn, move backward or forward at will without danger, and a great variety of figures were brought in range. When the toe was finally brought to a sharper point so that it could get a hold in the ice, the skater's field was practically unlimited. The next advance was the clamp skate—toe clamp and heel plate—thus doing away with straps altogether. The key that was then used to lock the toe clamp has been replaced by a lever and the heel plate by a clamp also—so that now skates are firmly locked to the shoe by a single movement of one lever—a very quick, perfect, and firm-holding arrangement. The skates now made for fast and long-distance skating have very long flat runners, making a long straight stroke easy, and they prevent the quick spreading of the legs, the short stroke, and inevitable turning consequent on the use of the ordinary skate made for plain and fancy skating. The best skate, like the perfect canoe, is an ideal, not a reality, and it always will be. It all depends upon the uses to which it is to be put, the age, sex and previous condition of servitude of the skater.

Perhaps as important parts of the skater's outfit as the skates themselves are his shoes. Unless the skates fit the shoes, and the shoes fit the feet, even as the paper does the wall, good skating is impossible. Boots, button shoes, and elastic gaiters can never be made to fit perfectly and stay put. Lace shoes are the only things for skating, since the "lost motion" can be taken up by lacing as it is in machinery by set screws. There must be no lost motion if good skating is to be done. But shoes tightly laced make cold feet, I hear you say. Not necessarily, I reply. Dry leather is a non-conductor of heat, wet leather is not. Therefore, the shoes must be dry, or else the heat of the foot escapes too rapidly.

When you start out for a skate put on dry socks. Stockings that have been worn for even a few hours have absorbed some moisture from the feet, and this dampness alone may insure cold feet, even if the shoes are otherwise kept dry. If there is snow on the ground, wear arctics and take them off when the ice is reached, being careful not to let any snow or ice touch the shoes. If you have a long way to go to get to the skating-pond, and there is a house near it, take a dry pair of socks with you and put them on just before going on the ice.

The rapid circulation induced by the exercise will keep the extremities warm unless they are unnecessarily exposed or improperly cared for.

Skating is violent exercise, and therefore light clothing is plenty warm enough while the exercise lasts. Heavy wraps impede motion and start perspiration when skating, and thus colds are easily taken. Stop for a moment and you are chilled. But exercise in light garments without perspiring, and the danger of catching cold is very small. When leaving the ice after a vigorous hour's exercise, a good heavy extra wrap is just the thing to put on.

I have frequently skated on still days, when the thermometer was hovering near the zero mark, with nothing heavier on than the usual fall jacket and light hammock hat, and not felt the cold in the least. To be sure, the under clothes were wool, and heavier than those worn in October; but not much. A flannel shirt is a comfortable garment for skating, as it is in fact for nearly all outing sports. The muslin-backed waistcoat is a delusion and a snare. For skating let it be all wool and a yard wide, not a fair front and a false back, but cloth all the way around, and then cold shoulders and a chilled back will not be discomforts to be endured, for they can be easily cured.

No one can learn to skate or do fancy figures on ice by reading. Like any other athletic sport, only practice makes perfect—or rather enables the devotee to approach perfection; for absolute perfection is out of the question in skating, as well as everything else. Hints may be picked up that will be of service in practice, and facts acquired that might lead to new lines of work, from books; but not much, if anything, more need be looked for.

The beginner will go where there are those who can skate "when he first puts his uniform on." There is so little friction to retard the motion of the skate over ice, that little power is required to induce motion when rightly applied. In fact, the friction of the body with the air is perhaps more of an item to overcome, if the ice is smooth. This is easily proved by trying to skate against a strong wind. The novice has a great aversion to lifting either foot from the ice till he is sure of his balance, and therefore is quite likely to learn to go ahead at first by a sort of sculling motion, a wriggle in fact like the motion of a snake.

"Which foot do you strike out with?" is a question often asked by the beginner. It seems more natural to put one foot forward at first, than the other. This should at once be overcome. Practice to educate both feet alike so that either can always be depended on. In learning to skate backward the sculling method is perhaps the easiest way, and the upper part of the body should be kept well forward to prevent falling. If one falls forward the hand can be depended upon to break the force, but a back fall is a more serious matter.

It is a very common thing to see skaters attempting quite difficult figures before they can skate straight ahead either well or gracefully. After acquiring a feeling of security on skates, and a fair proficiency in plain skating, the Outside Edge swing is the thing to work on. When the skater can take a long stroke and complete a circle on one foot, his body leaning slightly toward the center—when he can do this on either foot equally well—and not till then, has he mastered the outside edge. The curve described by the right foot on the outside edge bends to the right. If the right foot describes a curve bending to the left, it must be done on the inside edge of the skate. Motion is got almost entirely by the swing of the body in doing this, and not by a push given by the foot that is on the ice during the stroke.

The Dutch Roll is simply the outside edge swing, with a crossing of feet at the end of each stroke. As the right foot completes its work, the left foot is brought over the right and touches the ice to the right of it; then the body takes a left swing and the right foot is raised. The foot that is off the ice can be made to assist the body in giving power to the motion, if it is properly managed, and this knack can only be achieved by work. The outside edge and Dutch Roll learned forward, it naturally follows that the motion should be reversed and the same things done while moving backward. Learn to change from forward to backward skating and the reverse (turning equally well to right or left) while moving, at a hot pace and without changing the general direction in which the body is moving. The turn is a very simple one. Do it slowly at first.

The main roots of pretty much all the fancy figures are the outside and inside edge strokes, forward and backward. The best test of outside edge skill is to describe an eight—a complete loop with right foot, and another with the left.

If this can be done, say twenty times without stopping, and without departing far from the lines of the first one made, the necessary skill for many other figures has been reached. The skater must be able to do the eight both forward and backward, of course; then he can change it to a Dutch Roll eight. To make a large eight requires considerable momentum, for the power is principally applied at the start, or when changing feet. To make a small one requires good balance, a well-rockered skate not over-sharp, and a quick motion of the body. To add another peg to the list,—go around each loop twice on one foot before starting off on the other. The eight must be a small one to do this. The figure has been made by making three circles on one foot, then three on the other. How many different ways there are of describing the figure eight on skates I do not know; but there are certainly over fifty, and almost every skillful skater has his special pet among them. The one-foot eight either forward or backward on either foot, with its many variations, can occupy a skater for more than one winter, even if he devotes himself exclusively to it.

The grapevine cannot be described, but must be seen and carefully studied, to be performed. The single grapevine is done with both feet on the ice all the time; the motion is got by body swing and the face is always turned one way. The beginner will find that he can learn to do this figure from right to left more easily perhaps than he can do it the reverse way.

Many times has some companion come to me with "I wish you would show me the double grapevine. I can do the single; but don't know how the other goes." "Let me see you do the single." He does it toward the right. Then I ask, "Can you do it the other way," showing him at the same time how it is done. "No, I never tried it—well, it don't come easy. How do you do it again?" I show him, and then add, that "to do the double grapevine you must be able to do the single either way, for the double is but the single first to right, then a turn and then to the left." If the start is made with face to north in doing the single grapevine, face north all through. For the double, first face north (making to the east all the time we will say, or to the west, it does not matter which), describe one portion, then face south to do the next, and so on. This description will mean nothing to those who have not tried the figure.

The Locomotive before alluded to gets its name from the sound that is made. The skates strike the ice, beginning slowly, and then faster and faster as the skater moves along, making a noise similar to the puff of an engine when starting.

The grapevine, combined with whirls, circles, and extra touches—like the Philadelphia twist, which is nothing but an extra swing and recover made by each foot as it crosses the other—can be infinitely varied, and if well done, it is always graceful. It can be made to form a large eight, go in a straight line, or wind about, in and out, anywhere, everywhere.

It is impossible, in the compass of a short magazine sketch (without illustrations) to enumerate, or accurately describe, even a few of the many figures performed on skates. What is here set down is simply in the nature of suggestions, to be taken accordingly.

There are whole series of figures that can be made in a very small compass with one foot, while the toe of the other skate is stuck firmly in one spot—eights, backward and forward, hearts, etc. A great variety of these I once enjoyed working on in the back yard of a New York house. A heavy fall of snow came, and then it rained a little. My brother and I shoveled the snow off the grass plot and packed it down in the walks, bringing the whole yard to one level from fence to fence. Then with a hose from the kitchen window on cold nights we put a surface to the "pond," and got no end of fun out of our "rink," which we kept in good condition, much to the amusement of our neighbors, till late in March, and acquired great skill in small figures, simply because large ones were out of the question.

The man who will stick to one small spot and work over details, when he has a whole river of clear thick ice before him, does not get any sympathy from me. The long swing and graceful sweep of the powerful long-distance skaters always receive my admiration, and I would much rather accompany them—bringing up the rear, of course—on their cruises up creeks and across lakes, than to putter over figures. But there are many times when only a few yards of good ice can be had, and then figure skating and practice fills the bill; and the man who can only enjoy a big swing has to go home in bad humor.

"Say, mister, can yer write yer name?" The man who can do this—even if the urchin cannot read it—is the wonder of the skating ponds all over the country, and will be the talk of all the schoolboys in the neighborhood where he skates. Yet it is not a difficult thing to do—if you happen to have a short name. With the help of the toe, a push now and then, and a few one-foot turns, the name described in script letters can quickly be learned so that it can be clearly brought out on smooth ice. The old saying, "Fool's names and silly faces are always seen in public places," driven into my brain when very young, has prevented my performing this great feat often—even if I felt sure I could do it well, which I do not.

The man that can spin like a top, standing in one place, is sure to draw "crowded houses" wherever he goes, even if he cannot do anything else on ice. Therefore if you, gentle reader, crave notoriety, devote yourself to this one figure, for it is the royal road to popular fame on skates.

One of the prettiest of the simple figures is the club—like that on a playing card minus the handle. The first curve is made forward on outside edge, turn to backward on inside edge, then to forward again on outside edge, all done on one foot with the other off the ice. Do this with either foot, beginning either in outside or inside edge, and you have four variations, and four more backward. Bring the club into the form of an eight, with a club instead of a loop for each half, changing feet at the crossing, and the figure is perfected. Then do the whole eight or double club on one foot—either foot. This last is not an easy figure to learn, or to do gracefully and accurately.

In all one-foot figures the leg that is off the ice plays the leading part—it is the master and the other the servant.

One can see stars at any time by knocking the head on the ice. A better way is to draw them with the skates and leave nothing to the imagination. Every schoolboy knows how to draw a star with five straight lines coming together in five points. Do this on skates (both feet on the ice, disregarding the lines made by one foot), making the turns by jabbing the heel in when at the points.

The speed on skates is much over-estimated in the popular mind. For a short distance a man can run as fast as he can skate. Stories have been told of skaters keeping up with trains. The trains must have been very slow freight trains then, or else the story tellers lied.

The old reader stories of men on skates escaping from packs of wolves, I believe to be myths. My Newfoundland dog can beat me two to one in speed on the ice. I can start quicker and get away from him by short turns, but in no other way. Three dogs can always floor me in less than ten minutes; in fact, my bull terrier can often do it, single-handed, or rather four-footed.

The moral of it all is, "Go skating." Whether you skate ten miles on a stretch, or ten yards, matters not. The exercise is healthful anyway, and a great reviver of low spirits. Let the theater go for one evening, with its close and exhausted air, and go where fresh air is all that you can breathe. The sleep that will follow an hour's skate does not bless a man every night, and the new interest that he will find in the ordinary drudgeries of life the next day will surprise him. Nature makes the ice and man the skates. The ice costs nothing, and the skates very little. Perhaps you have not skated since you were a boy. Then put on skates once more, and, my old bald-headed friend, you will find yourself a boy once more—even to the inevitable fall.

OUTDOOR RECREATIONS

Sports that Make the Man

By SIR THOMAS LIPTON

WATERLOO, we have all heard, was won at Eton. Equally on other play-fields have great Battles of Business been gained. Exercise and the open air, sports and pastimes, no less—and sometimes more—than office application and the bending over books, go to making of commercial success.

I was brought up on the banks of the Clyde. Many an hour did I spend, as a boy, by the riverside watching the craft and indulging in day dreams. My parents were poor, so that I could not then afford the luxury of a yacht except in imagination. For there, sure enough, was the mental picture of the "not impossible She"—no woman of the poet's fancy, but a white-sailed lady of the seas.

The allusion, by the way, has its own aptitude. The "not impossible She" of early dreams turns, in inconstant life, to several very possible "shes"; and my ladies of the sea, too, now number three—Shamrock, Erin, and Shamrock the Second. Whenever I had a shilling to spare in those early days I was certain to lay it out on the hire of a boat. When, as often happened, my purse was empty, I proffered my services as steersman for the sake of a sail. Then, as now, this was my favorite sport. But horse exercise also has been always well in the running. And with these the tale of my recreations is but at the beginning.

When I see a boy who does not care for cricket or football, I conclude that there is something wrong about him; I have the feeling that he cannot be in good health. Outdoor sports ought, in my opinion, to come to the young as naturally as food. In all warehouses and factories where there are enough employees, I strongly advocate the formation of football and cricket teams and of tennis clubs. In my own firm are footballers and cricketers who can hold their own against any similar association in London. My lady clerks have a tennis club. We also have frequent dances. I have always thought dancing a fine exercise. It works well, too, with another exercise very different in kind, but a very healthy one in its own way—the ascent of the Ladder of Fortune. There is a good old expression about "dancing for joy." That is the ideal dancing. Byron somewhere speaks of the young ladies who have to waltz for a husband. That is almost as far removed as the dancing behind the footlights for a living from the real spontaneous movement that expresses "joy of our youth," and is health-giving.

Music does not come to all naturally, and musicians, like poets, must, I know, be born, not made, or must at any rate be both born and made. But I would have music taught elementarily to all. That is a part of education still too much neglected. Singing and playing are among the real recreations of life, if only as indoor resource during bad weather, when you are not in the mood for books, and when companions become (as the best sometimes will) a little bored with each other. I may add that I have played the violin in my own fashion since I was ten years old.

I would go so far as to urge compulsory military drill in schools. I am a volunteer, and am now forming a company among my own employees. The moderns have a good deal to learn in these matters from the ancients. I am aware that Athens was not saved by the gymnasium or the military college; but the young Athenian became decadent in spite of, not because of, his physical exercises.

It is hardly necessary to ask me if I am a believer in Saturday's half holiday and Sunday's rest. I have no hesitation in saying that it is a mistake, mentally and physically, for any man to work seven days without ceasing, however young and strong he may be, and however ardent to make strides in business. Off hours from my business I spend as far as possible in the open air. I leave behind me the city at night. Even now, when of necessity I dine frequently in London, I drive ten miles into the country to sleep. The extra trouble and the loss of time are well repaid by the pure air. That is my opinion, and I leave others the smile at the suburbs.

Gardening, I agree with Lord Tennyson in thinking the most perfect of recreations—it gives you just enough to think about to be a complete distraction, yet not enough to worry you. And it is work-play done under delightful conditions. The hour in the garden at the beginning of the day, or at its close, is worth many sacrifices in the winning. Though I have never been able to get to bed before midnight, I am always up at seven—an allowance for sleep that is less by an hour than Lord Palmerston gave out as indispensable—at any rate for statesmen. Other spare half hours at home go to outdoor games—cricket, golf, tennis, and bowls. If one must be indoors, a game of billiards I find to be a grand exercise. You walk miles, to begin with; and a private table is a great attraction to keep together the young members of a household in the evenings.

From all this, it follows that I am not a great theater-goer. I do not think I have sat out a play more than twelve times in my life, and never did I do so till the last very few years. My parents, being old-fashioned and church-going, had never seen the glare of the footlights; and I felt that I could not properly allow the time to give myself up to being amused for so long by other people—and in a vitiated atmosphere. I felt I could do better for myself.

Sport and gambling are often supposed to be inseparable. Many millions of dollars are put up on yacht racing, but never a dollar by me. I have yet to make my first bet. I race purely for the pleasure of the sport; and I would not bet on my own boat or any other.

I think the American boy is ahead of the English boy. I find that in America the managers of large concerns are often very youthful. In England their youth would be a disqualification. It would not command respect. A man must look old before he is thought to look wise. That I believe to be a great error of policy in the affairs of a nation, a business firm, or a family.

I hold, therefore, that it would be a good thing to send every English boy to America when he is seventeen, and to keep him there for a couple of years. I first went to the States when I was fifteen; and my experiences at various places, all over the country, were the best commercial training I ever had. I find that apprenticeship still stands by me, and it helped me, more than anything else, to the position I occupy.

OUTDOOR RECREATIONS

A Common Sense Swimming Lesson

By DUFFIELD OSBORNE

EVERY one who has access to deep water ought to be able to swim, and yet many who are so situated cannot swim one stroke.

These are statements that will not be disputed; but let me add to them a third:—

Any reasonably normal individual between the ages of infancy and senility can be taught to swim, and can be taught easily, surely, and in a remarkably short time.

At this point, it may be well to give ear to the chorus of disagreeing voices—many of them women's—exclaiming very much to this effect: "I can't learn. So-and-so and so-and-so have tried to teach me, but it's of no use."

Very well. The best answer I can make is: "Come with me, and I will teach you to swim in one lesson. I will not teach you to swim well, or far, or fast, but I will show you that you can keep yourself up in water. That done, the rest is mere strength and practice; and, meanwhile, consider how many times the power to swim a dozen strokes might mean safety; recall how sadly often the ability to regain an overturned boat would have meant one less in the sad list of accidental drownings.

Perhaps you will note incredulity in your pupil's eye, when you speak so positively of her capacity to learn—incredulity that is not unjustifiable, in view of the thought that every book and every teacher I have read, seen, or heard of, seems bent upon deliberately complicating a very simple proposition. It is one of those curious instances of how clever people persistently overlook things obvious, and are prone to create difficulties where none exists.

The accepted method is for the teacher to take the pupil into water of from three feet upward, and, supporting him by chin or belt, to explain the motions of the breast-stroke. The aspirant is told just how he must shoot out the hands together, just how he must turn them, and sweep them apart and back, just how to draw them in to the body and shoot them forward again for the next stroke. At the same time, it is explained that the legs should be drawn up, shot out well apart, brought together, and drawn back again. This double movement is just a trifle complex, though both teacher and pupil are probably so familiar with its details, the one in practice and the other in theory, that its complexity is hardly realized. So the teacher supports the pupil, and the latter goes through the explained movements more or less accurately. Then the support is withdrawn, and presto! what form the beginner has attained is gone on the instant, and he flounders hopelessly.

In the face of the one overwhelming fear that he may sink, all memory of the stroke goes by the board; the hands pat the water with no seeming aim but rapidity of movement, while the legs, in nine cases out of ten, promptly forget to move at all. Unless the teacher comes swiftly to the rescue, he is apt to have a half-strangled pupil on his hands, sometimes an indignant, and, usually, a somewhat discouraged one. Add that the same thing is tried over and over again with more or less similar results, so long as the patience of the two holds out, and you will have the conventional first swimming lesson.

If support be withdrawn gradually, the collapse follows quite as surely; while as for the efforts of those who are trying to teach themselves, it is the same story the moment they venture to discard their life preservers, boards, or other devices.

Of course, in the great majority of cases the aspirant ultimately learns to swim, in spite of early difficulties, but it is seldom without a very considerable expenditure of time, and we all of us know many who, whether from timidity, or nervousness, or lack of sufficient opprtunity, have never found themselves able to take the supporting strokes when deprived of extrinsic support.

So much for the negative, and now let us consider the question from a positive standpoint.

Animals swim instinctively. That is the first proposition. Civilized men and women do not. That is the second. Human beings compare, not unfavorably, I think, with most animals in the matter of the relation of weight to bulk. Why, then, the difference?

The answer generally given is doubtless correct. It is all a question of nerves. Men and women who can't swim are afraid of sinking. Therefore, they get nervous, and don't swim. Animals never think of it at all, and swim naturally.

Yes, that is all there is to it—not just the matter of nerves and fear, mind you, but also that little word, "naturally." Animals swim naturally. If, however, it were possible, and if you attempted to teach them an artificial stroke as a *sine qua non* of success, I warrant you would find almost as much difficulty in the matter, my dear professor, as you found in teaching Miss LeMonde at Narragansett last summer.

Now, when I speak of the breast stroke as artificial, I do not mean that it is not the best all-round stroke for a man or woman to use. I also admit that some of the side and overhand strokes—all highly artificial, by the bye—are even better calculated to gain speed. To tell the truth, swimming is such an ancient science, that we have forgotten what were its beginnings, and what are its outgrowths. At any rate, whether you call the breast stroke artificial or not, for we shall not quarrel as to terms, I imagine most people will admit that in their first lessons they found it considerable to think of and to remember practically.

Here, then, is my third positive proposition. Given a certain degree of confidence, very little motion of any kind, and in most cases none at all, is required to keep enough of the human body out of water to prevent drowning. If, however, it is desired to lie breast downward, with an idea of making more headway than is possible when lying on the back, the fact that the added weight of the head must be sustained, without relative water displacement, makes some definite action necessary. That, however, the breast stroke is not the only movement which will accomplish the end, we all know, and the very simple question suggests itself: is there no simpler stroke that can be taught the beginner? next to one that will require no thought at all, that he will take to naturally, and by the aid of which he can learn how really easy it is to keep himself afloat.

The answer is equally simple. The animal keeps itself afloat by simply moving its legs as if in the act of going up a steep hill, and most swimmers, after they have learned the breast stroke, make occasional trial for the purpose of rest or experiment, of what boys call "swimming dog-fashion." The legs are kicked out alternately, the hands are paddled forward and back alternately. There is no combination movement; nothing at all to concert, or to think of, except to keep legs and arms paddling slowly under water and (desirably) with the fingers together. A mere suggestion by the teacher will be understood at once by the pupil, and not readily forgotten when the time comes to depend upon it.

Here, then, is the order of exercises. Take your pupil—the most timid woman you know—into about three and one-half or four feet of water; impress upon her the fact that almost any motion of hands and feet will keep her mouth above water. Then show her the dog-fashion movement, and see that she understands it as far as the action of her hands is concerned. Tell her all she needs to do with her feet is to kick them out slowly and alternately. You will be surprised to find how readily she takes to it. Now promise her that you will not let her go under, and hook one finger in her belt behind. Then tell her to strike out slowly as directed.

Usually very few corrections are necessary, and those so obvious that the pupil at once sees their force and adopts them —again, naturally. The exhortation to take it easy is the one you will have to use most persistently.

When arms and legs are working right, gradually lessen the support, always keeping your promise, until you find no weight whatever on your finger. This will usually take little more time than is enough to assure her that you are reliable, and the moment the result is attained, announce that she has kept herself up without help and make her realize that it is the truth.

After a little practice, let your pupil try alone, standing close by and still guaranteeing that her head shall in no event go under. After several trials—often in one—she finds to her delight that she can keep up and, perhaps, even make you take two or three steps beside her.

The hardest part, which is not hard at all, is now over. Confidence and satisfaction have taken the place of nervousness and doubt. She has gotten to hardly think at all of her stroke: it is so perfectly natural and spontaneous.

The next thing is to walk a few feet away—not too far—and tell her to swim to you. You may have to step forward and hold her up now and then, but if your distance is well chosen you probably will not, and so she sees for herself that she has not only kept up, but made some headway.

Gradually increase the distance. She will probably declare that she cannot accomplish each longer course, but she will do it. She is on her mettle now, and I have seen three women, who declared "they could never learn to swim," doing ten and twelve-foot heats, dog-fashion, at the end of the same hour, during which they had rested and tried alternately.

All of this seems so simple and obvious when it is once told, that I almost wonder at myself for having thought it worthy of writing out. The sole difference between my pupil and those of others is that mine has no stroke to think of; no movement of arms or legs to make, that she will not make naturally. Thus there is nothing but confidence to instill, whereas all the books and the teachers I have seen cling to the practice of making their pupils learn correctly from the beginning; everything at once or nothing at all; a basic difference that must serve for the justification of this article.

Just a word further. There are, undoubtedly, many accomplishments, perhaps most, in which this learning correctly from the beginning is desirable, if not positively necessary, provided one ever hopes to become at all expert. Swimming, however, I submit, stands almost by itself in this respect, for the very good reason that there are really two things to learn instead of one, and the two are totally distinct and far apart. The first is courage and the confidence that you can swim, and the second is swimming in the different styles best calculated for speed, distance, power, and general utility.

The first is attained when the pupil knows that he can keep himself up for a few strokes. This realized, he will learn the second for himself, for he doubtless knows, or can see or hear described, all the accepted strokes; and, having once gotten confidence from experience of the ease with which he keeps himself afloat, his mind is free to really begin practice and to perfect himself at his leisure in the details of good swimming.

There may be people who, even if properly handled, cannot be taught the confidence part in one lesson, but I have not found one yet.

OUTDOOR RECREATIONS

Hints to Swimmers

By ARCHIBALD SINCLAIR

WHEN turning in a bath (swimming with over-arm stroke), place the hand of the lower arm flat against the side under water, and then take breath, swing the other arm round, dip the head and draw up the knees. This will turn the body. Then place both feet against the side, shoot the arms forward and push off, the head being under water as the turn is made.

2. When bathing in open water, look out for weeds and undercurrents. In the event of getting accidentally into weeds, stop kicking and simply move the hands as if "sculling." If you swim, the weeds will entangle round legs and arms.

3. If a current or tide be too strong for you, swim diagonally across it to a spot on either bank, or on shore.

4. Do not dive deep into strange water, especially a lock pool, unless you be an expert, or some one who knows the place be present.

5. To take a straight course in open water, pick out some prominent object on the bank and guide yourself by it.

6. Beware of broken bottles, tins, etc., in river beds.

7. When racing in the sea, you can ascertain the set of the current, and the best course to take, by throwing in a cork, or similar floating object, and closely watching its progress. The swimmer who swims straight from point to point, although perhaps speedier than others, very often loses by getting into slack water.

8. When stung by jellyfish, rub the juice of a lemon well

in, or use glycerine and rose water. When seized with cramp, turn on the back and rub the limb affected and kick vigorously. At the same time call loudly for help.

9. When in a rough sea, swim through each wave, not over.

10. Beware of barnacles, when pushing off from an old ship, the side of a pier, or sunken rocks.

11. When diving from a boat always go off the stern. When getting in a boat, lay hold of the stern close to the gunwale with one hand and catch the gunwale with the other. Kick hard and raise the body sideways until it rests on the edge of the stern, then quickly move the hand from the stern to the seat, and slide backward into the boat.

12. Rub yourself well and take a brisk walk after every swim. When in good condition, bathe every day, and in open water for preference.

The diploma examination of the Life-Saving Society has been used by writers in relation to the teaching of swimming and the qualifications which should be possessed by instructors. The examination is divided into two parts, the one theoretical, the other practical. In the theoretical examination the candidate has to write an essay on the following subjects:

(*a*) Importance and advantages of the knowledge of the art of swimming.

(*b*) Effect of swimming as an exercise upon the growth and development of the body.

(*c*) A short description of the lungs and respiration; the blood and its circulation.

(*d*) The effect of excessive exercise or over-fatigue, and the physiology of breathlessness.

(*e*) Precautions as to loss of heat, and how to avoid cramp.

(*f*) The best method of teaching swimming.

In the practical examination (which may be taken in one or two parts) each candidate must perform in the presence of the examiners the following evolutions, in fresh water:—

(*a*) To carry—dressed in a swimming costume, shirt, tie, collar, socks, boots, trousers, waistcoat, and jacket—a person by the second or third method of rescue a distance of at least fifteen yards.

(*b*) To undress on the surface of the water.

(*c*) To swim continuously (i.e., without any pause or rest) for twelve minutes in the following four positions:—

(1) on the breast, (2) on the back, using arms and legs, (3) on the back, the arms being folded on the chest, (4) overarm side stroke. Three minutes allowed for each position.

(*d*) To dive from the surface of the water to a depth of at least five feet and raise a weighted object.

(*e*) To float motionless on the surface of the water for at least thirty seconds.

(*f*) To dive from heights not exceeding five feet and twenty feet.

(*g*) To plunge a distance of not less than forty feet.

(*h*) To swim by means of the propeller a distance of thirty feet.

(*i*) To turn from the surface of the water two somersaults forwards and backwards.

(*j*) To perform three voluntary movements illustrating fancy and scientific swimming.

(*k*) To illustrate, as may be required by the examiners, the best method of teaching swimming, diving, floating, and life-saving.

A maximum of ten points is allowed for each subject and movement. Any candidate failing to obtain fifty per cent. of the maximum for each subject or movement is disqualified.

OUTDOOR RECREATIONS

Long-Distance Walking

By FRED COTTON

THIS is the age of cycling, nor can it be denied that cycling is a most fascinating and rapid means of getting about. In these days of hurry the fact of a man's being able to compass on the wheel fifteen miles an hour without any distress to himself, constitutes an incontrovertible argument in favor of the bicycle. At the same time, from the point of view of physical condition, there can be no comparison between the cyclist and the pedestrian, who, in six hours, while the former is traveling his seventy or eighty miles, is content to cover his twenty-five miles on foot.

The late Sir John Astley, one of the keenest of sportsmen, brought long-distance walking into great prominence a few years ago, when some wonderful performances were accomplished. Of track-walking the writer does not propose to treat. It is entirely for the benefit of amateurs who may feel inclined to attempt a long-distance walk that the following hints, the result of some experience, are intended.

Patient and systematic training is the chief consideration: to get condition and keep it. It is of the first importance that the feet should be good. Good feet are indispensable, and without them long distance walking must never be attempted. Assuming, then, that the intending walker has naturally good feet, they must in addition be well cared for. It is the greatest mistake to suppose that a horny foot is durable in proportion. The skin should be supple and pliant. After the bath the feet must be thoroughly dried, well hand-rubbed, then soaped all over. Some advocate softsoap, but good brown soap is preferable. The socks, too—*lambswool* is the best material—should be well soaped. Strong *shooting boots* or *shoes* are to be recommended, having a long, low heel, with plenty of nails (but large nails are a mistake) at the toes and sides. It is also well to bear in mind the maxim "The heavier the man, the stronger the boot." Flannel underclothing is indispensable.

TRAINING AND DIET

The preparation should be gradual. The man who attempts only fifteen miles on the first day will at the end of a week cover thirty with infinitely greater ease. The feet must on returning home be the first care. Excessive tubbing is not recommended; it is far better to rub them well, first with a damp towel, and then with a dry one, followed by more hand-rubbing. Regular hand-rubbing also for the legs, back, and loins is the great secret of keeping in condition.

A man in really hard work can eat anything. The less he drinks, no matter what the liquor, the better; and the sounder his condition, the less thirsty he will feel. During the early days of training, a man naturally perspires a great deal, becoming, in consequence, very thirsty, a craving that should, however, be fought down. It is an excellent plan to rinse the mouth with water. Sluicing the arms up to the elbows in water will also be found to relieve the thirst to an almost incredible degree; and water which is not fit to drink may still be utilized by standing in it above the ankles for a few minutes. The feet will soon dry, and if the pedestrian keep going, he will suffer no ill effect.

As a practical instance of a long-distance walk, the writer undertook on one occasion to walk from Derbyshire to the north of Perthshire, a distance of three hundred and forty-seven miles, in a week. He had trained, it is true, to a certain extent, though not by any means as carefully as he would now, were he fit to undertake what he then accomplished. At the end of the first day, after he had covered fifty-eight miles, his feet went completely to pieces, which may be partly attributed to the fact that for the last seventeen miles the road was paved with great cobble-stones. The second day, on which he started in acute pain, put another forty-six miles to his credit; on the third his feet gradually improved, and he ultimately arrived at his destination with three and a half hours to spare. It is significant, as bearing upon the principle of abstinence advocated above, that the writer's bill for wine and spirits during that week did not amount to half a sovereign, and this included a plentiful dose of brandy, when on the second day he fainted three times.

OUTDOOR RECREATIONS

Wrestling

By WALTER ARMSTRONG

THERE exists so strong an affinity between wrestling and boxing that the one may be considered a useful and natural adjunct to the other. But, in order to make the pastime generally popular, it is the opinion of many that a style on the "catch hold" principle should be generally adopted. At the present time we are lost in the maze of a variety of systems —Græco-Roman, Cumberland and Westmorland, Lancashire (catch as catch can), Cornish and Devon, Scottish, Irish, German, Swiss, Japanese, Indian, and others. Without doubt the Græco-Roman fashion of wrestling is productive of some excitement when witnessed by the uninitiated; but, apart from that, it may be asked, "What useful purpose does it serve?" As the struggle proper does not commence until both the competitors are on all fours on the ground, it is useless in a hand-to-hand encounter, where fair play is insisted upon. To have to throw an opponent down, and afterward mangle him while in a helpless position, is somewhat inconsistent with the feeling which prevents a man striking an adversary when he is down. The following are the Græco-Roman rules:—

The wrestlers are only allowed to take hold from the head, and not lower than the waist.

Tripping and taking hold of legs are strictly forbidden.

The wrestling is with open hands, and the wrestlers are not allowed to strike, scratch, or to clasp hands. Clasping hands means that the wrestlers shall not clasp one of their hands within the other, nor interlace their fingers, but they are permitted to grasp their own wrists to tighten their hold round their opponent's body or otherwise.

The wrestlers must have their hair cut short, also their finger nails, and they must wrestle either barefooted or with socks.

If one of the wrestlers fall on his knees, shoulder, or side, they have to start again.

If the wrestlers roll over each other, the one whose shoulders shall touch the carpet first is deemed the conquered.

To be conquered, it is necessary that both shoulders of the fallen shall touch the ground at the same time, so as to be fairly seen by the judges and the public.

The most surprising thing is that tripping should be prohibited. Tripping is the very essence of the art of wrestling; without the chips and other maneuvers peculiar to the science of English wrestling, there remains very little beyond weight and strength to battle with.

When Paul Pons, the gigantic Frenchman, and the equally brawny Memisch, of Turkey, met in a real contest, Græco fashion, in London, the men both got down on the carpet early in the struggle and sat on the floor for two hours and fifty-five minutes, neither daring to get on his feet, and a draw had to be declared, no fall being recorded. This so-called system, dignified by the high-sounding Græco-Roman title, was foisted upon the British public in 1870, when the French giants, Le Bœuf and Dubois, contended with the Cumbrian champions, William Jameson and Richard Wright. Both parties scored in their own style, but the Frenchmen eventually won the match through the doubtful issue of a toss up for choice of styles in the concluding bout, the Frenchmen, who won the toss, naturally choosing their own method. The two systems are so dissimilar that the merits of the men were never fairly tested. Yet, though Jameson and Wright failed to hold their own under Gallic rules, it was evident at the time that a little tuition and practice would have enabled the Cumbrians to compete successfully with their rivals. The English and French champions subsequently visited most of the principal wrestling towns in the North, but the game was generally looked on with disfavor except in a few of the leading wrestling resorts in Lancashire, where a style of wrestling nearly akin to the Græco-Roman fashion prevails. This, instead of being the art of standing up against an adversary, is simply the art of getting down in a certain position, so as to avoid being thrown a fair back fall. Tripping is the very backbone of the science of wrestling, and a system that does not teach a man to retain his perpendicular in the face of attack is of very little service, either as an athletic exercise, or as a means of self-defense. Ground wrestling on all fours, which includes throttling, is dog fighting pure and simple, and can only have been invented with the view of bringing an ancient and useful pastime into disrepute. When Greece took a leading position in the promotion of wrestling and other athletic exercise, ground wrestling is scarcely hinted at. In the celebrated contest, for instance, between Ajax and Ulysses, we are told that the champions endeavored to "keep on their legs," and when Ulysses plied the outside stroke, supplemented by the back heel, and fell on the top of his opponent, the contest was over and the populace satisfied.

The following are the rules for wrestling in what is known as the Cumberland and Westmorland style:—

On taking hold with the arms round the body, the right arm underneath and the left above, the wrestlers stand chest to chest, each placing his chin on his opponent's shoulder and grasping him round the body, each placing his left arm above the right of his antagonist. When both men have got hold, and are fairly on their guard, the play commences, and with the exception of kicking, they are allowed to use every legitimate means of throwing each other.

If either party breaks his hold, that is, loses his grip, though not on the ground, and the other still retains his hold, the one so leaving loose shall be the loser.

If either man touches the ground, with one knee only or any other part of his body, though he may still retain his hold, he shall not be allowed to recover himself, but shall be deemed the loser.

If both fall to the ground, the man who is first down, or falls under the other, shall be the loser, but if they fall side by side, or otherwise, so that the umpires cannot decide which was first on the ground, it shall be what is technically called a "dog-fall," and shall be wrestled over again.

In securing a grip for the Cumberland and Westmorland hold, the best way is to make of the hands a couple of hooks, by placing all the fingers of one hand into the other hand held in the same way, so that the back of the right hand shall press on an antagonist's back. Laying hold of one wrist with one hand, or clasping hands, are fruitless methods, as the former shortens the arms, and the latter gives an insecure grip which is easily broken. Having obtained a good hold, make play at once while the grip is retained, and always keep the right arm well up in order to prevent an adversary from getting too low a hold.

The back heel is without doubt the father of all wrestling chips; in fact, every man, boy, and child in the universe naturally resorts to the back heel in the emergency of a hand-to-hand struggle. When a wrestler gets a leg behind his opponent's heel on the outside, it is termed back heeling. Always back heel with the left leg and as near the ground as possible. Those learning wrestling in the Cumberland and Westmorland style—indeed, in any other style where tripping is recognized—should commence their study of the art by getting proficient in the back heel, which is also a saving measure, for when a wrestler is in danger of being lifted from off his feet or swung round, the insertion of the back heel often brings about the downfall of an antagonist. Again, when a wrestler feels he is being back heeled, he should slacken his hold and lean forward; if he once allows himself to be pushed back, over he must go. Finally, the back heel should not be taken out when once inserted, especially against a long-legged man, who is always a dangerous opponent.

The outside stroke with the left leg is George Steadman's, the champion of England's, favorite chip. The best way of using it is to twist your antagonist suddenly to the left, at the same time striking him with the left foot against the outside of his right ankle, as near the ground as possible. This, with the assistance of the arms, is generally effective.

The hank, when manipulated by an expert wrestler, becomes one of the hardest and most dangerous falls of all. It is a very insidious chip, and brought about by turning your left side to your opponent; then click [trip] him and lean, or rather fall, backward; but be mindful that the click is secure, and the result will be that the leverage supplied by the inside click will bring about the downfall of your antagonist. The only way to elude the hank is to lean forward and endeavor to obtain an improved hold. The hank is one of the most uncomfortable falls imaginable, as the wrestlers usually reach the ground glued together like a couple of planks. If the man who falls uppermost is sometimes thoroughly shaken, how, may it be asked, does the underneath individual fare?

The inside click: Face your opponent squarely and jerk him toward you, when he will naturally step forward with one leg. He will try to steady himself by hanging back, which assists the expert inside clicker, who dashes in the chip, adding to it all the weight at his command. To click an opponent's right leg on the inside with your left, or his left with your right, or to use the cross click, that is, to click his right with your right or his left with your left, seems easy on paper, but the maneuver requires an enormous amount of practice, and few men excel in the movement.

The cross buttock with the left leg is the best. Turn your left side to your antagonist, and rapidly cross both his legs with your left leg, at the same time twist your man forward with all the force at your command.

Few know the difference between the cross buttock and the buttock. In the buttock, which is the finest of all wrestling chips, the legs are not used, and therefore great strength and quickness of action are necessary. It is accomplished by turning the left side quickly round, getting your back under your opponent's stomach and throwing him bodily over. It is an unsafe chip, and, although very attractive-looking in exhibition wrestling, is seldom resorted to in genuine contests. Buttocking is little known beyond the confines of Cumberland and Westmorland, as no other style of wrestling is suitable for its display.

The hype: After securing a tight grip, step forward with the left leg, lift your opponent, and carry him to the left about a quarter of a circle, taking care the while that both his feet are free of the ground; at the same time strike the inside of his left leg with your right knee, which, if properly done, will land him plump on his back. This is the right-leg hype. The left-leg hype is used in the same way, only the left leg is used as the aggressive weapon. It is accounted the utmost folly for a short man to attempt to hype a wrestler much taller than himself. A short man, say of five feet six inches, cannot lift a six-foot grenadier high enough from the ground to hype him. The swinging hype differs in no great degree from the hype itself, except that it is necessary for the wrestler to swing his man after lifting him, and previous to applying the hype.

The outside click is a very useful trick in wrestling, and when you find yourself being lifted, you should click your antagonist with your left leg, as in the back heel. Light-weight men cannot attach too much importance to this clip, as it often happens that the click on the outside is the only defence that they can make against superior weight and strength. Click smartly and low down, for in that consists the efficiency of the chip.

The breast stroke seems a simple move, but it is difficult to meet, and has baffled some of the best wrestlers in England. There is nothing particularly clever about the maneuver. The assailant, however, requires great development of chest in order to accomplish it successfully. Grasp your opponent firmly round the body, twist him suddenly to one side and then to the other with a rapid jerk. As the legs are not brought into play, the fallen one often cannot realize by what he has been thrown.

The foregoing are the principal chips used by the best Cumberland and Westmorland wrestlers of the present day. Wrestling, however, can only be learned by continual practice commenced at an early age, as it is very seldom that a man attains any proficiency who commenced to study the exercise when out of his teens.

The Lancashire style of catch as catch can wrestling is considered by its exponents to be much in front of all other recognized systems. It is certainly the roughest of the three English methods, as unlimited action is allowed, which includes struggling on the ground, catching hold of legs, and other tactics. Throttling and breaking arms are forbidden, but these are sometimes indulged in when the Lancastrian "birse" is up. A man on his hands and knees must not be choked by being pulled upward by his opponent, but either party may break fingers or arms, so long as the referee is satisfied that such took place solely in the struggle for the mastery, and not through any desire to act unfairly. The Lancashire system is closely allied to the French or Græco-Roman style, the only material difference being that the French method forbids tripping, and catching hold of legs, whereas both are allowed under Lancashire rules. The principal chips associated with catch as catch can wrestling are the double Nelson, the half Nelson, the heave, the Lancashire lock, the flying mare, and the three-quarter Nelson. The double Nelson is now barred at most wrestling gatherings, on account of the danger attending its accomplishment. It is brought about by getting behind an antagonist and placing both arms under his; the assailant then clasps his hands behind the neck of his opponent, and bends his head downward in such a manner that his breastbone will give way if he does not previously measure his length on the ground. Two shoulders down constitutes a fall.

Generally speaking, Lancashire wrestlers assume a half-stooping position at the commencement of an encounter, and either seize each other by the wrists or get into head holds, when, after much wriggling, they fall struggling to the ground. Here the real contest begins, the point aimed at being to bring the opponent on to his back with both shoulders at the same time, which constitutes a fair back fall.

In the half Nelson, grasp your opponent by the right wrist with your left hand, place your right hand under his arm, while you seize him by the neck, and press his head forward: then quit his right hand and clasp him round the waist underneath with your left arm, and you will easily heave him over on all four points. The heave is also a useful chip. Place your right arm round your opponent's right shoulder and reach over to his left loin, at the same time slip the left arm under him so as to get hold of his left elbow; a complete somersault is often the result. One way to stop the heave is to cross-click your man and then ply the cross buttock.

The Lancashire lock is used when each wrestler grasps the other by the thigh, and both struggle to get on all fours, the half Nelson usually then coming into play. If you catch your opponent by the thigh, and get underneath his body before he is down, you can lift him bodily up shoulder high and dash him down with considerable violence, if so minded. This is also called the Lancashire ham and leg.

Probably the three-quarter Nelson is the most useful of Lancashire chips. In the first place, grasp your antagonist round the neck with both hands, without allowing him to get a similar hold, and then you have him in a good position for the buttock or cross buttock, which no other form of catch hold wrestling supplies.

In the emergency of an unexpected attack, the Cornwall and Devon style, or West Country method as it is often called, would probably serve a man better than either the Cumberland and Westmorland or Lancashire systems, provided fair play were observed on both sides. The champions hailing from the West wrestle in strong linen loose jackets, reaching to the hips, and tied by linen strings in front. Catch hold above the waist is the rule, or by any portion of the jacket. There are two great drawbacks connected with this style of wrestling. First, the wrestler must be attired in his jacket ere he can display any of his best points, and, second, their definition of a fall—which is three points down: two shoulders and one hip or two hips and one shoulder—is always productive of endless wrangling among the partisans of the contending parties; a circumstance that has probably tended to wipe the practice of this exercise almost out of existence. A man must be thrown flat on his back before any portion of his body touches the earth ere a decision can be given against him. Kicking, which was a specialty of the Devonians, is now abolished and the two styles amalgamated. The jacket is the great factor in these contests, and some astonishing throws are often brought off when a proper grip has been secured by a powerful and expert wrestler.

It is usual to grasp the jacket by the bottom corners; or, by slipping one arm under the garment and seizing the opponent's collar, a telling hold can be obtained. The wrestlers are forbidden to take hold of the two corners of an opponent's jacket for the purpose of strangling him, and they must not grasp by the drawers, handkerchief, or belt. The flying mare, the inside lock forward and inside lock backward, which are the best throws in this style of wrestling, may be briefly described.

The best position to assume before taking hold is to stand with the feet a trifle apart, and the knees slightly bent, so as to be ready for either attack or defense. Ground wrestling is forbidden, and a man must be thrown very decisively before a verdict can be recorded against him. A cunning wrestler, when he finds himself going down, very adroitly makes for the ground face downward, in order that he shall not be landed on his back. Consequently, a match in this style often lasts several days.

The flying mare: Seize your opponent's left wrist with your right hand, then quick as thought turn your back upon him, at the same time grasping his left elbow with your left hand, and swing him over your back, as in the buttock, with a sudden jerk. The best method of preventing this is, directly your adversary gets in front of you, to click him from behind, at the same time clasping him round the body with your right arm. By this means you may get in the front position, when the half buttock should come into operation and your antagonist will, as a rule, be thrown on his face.

SPORTS AND GAMES

Angling

By WALTER H. SMITH

NOT many years ago, when fly-fishing was an accessory to the art it has become to-day, fly-makers and anglers attempted to imitate natural insects both in form and color, while the modern fly-book will contain several dozen pretty deceits, rich with impossible colors, and very unlike nature, though rather attractive to the fish; so they have been classed with a host of others as standard varieties.

Now the question arises, Do fish really rise to the artificial fly because of its resemblance in form and color to a natural one? I think not, and am positive that success depends more upon the size of a fly than in its likeness to nature; also, that one might fish through the United States with three combinations of color in his flies and be as successful as another using fifty varieties. Every fly-fisherman knows that it is best to use large, bright flies in dark windy weather, or early in the morning and at evening; but the fish do not always rise to them, so a little subterfuge is occasionally necessary; a complete change in the cast, or, better yet, in the size of the very flies you have been using—if you know them to be good ones. I remember having whipped the stream below Upper Dam, at Rangely Lakes, one dark, windy morning, for half an hour without a rise. It was just about time to be discouraged, for I was using the very flies for such a morning—a large Montreal and silver doctor—but I changed them for *three* minute ones of the same kind, and my first cast was responded to by a double somersault from two large trout, who fairly swallowed

GOING A-FISHING.
From a Drawing by Martin Justice.

the *three* flies. This might be called good luck; but it is one instance among many where a change in the size of a fly has proved a success.

There is a certain class of anglers who believe in taking salmon and trout with the fly alone, and they are quite right in thinking it the truly sportsmanlike method; but at times fish will not rise to anything, so the ordinary fly-fisherman, after trying his best flies, will resort to the worm, and fill his basket. Yet we must sympathize with the scientific angler as well as the man who wants fish, and assure them both that trout are seldom very demonstrative toward the fly when they are taking bait freely below the surface of the water.

In selecting his flies the novice will find it good policy to have each variety tied upon several-sized hooks, and by faithful use of these at odd times, and during various conditions of wind and water, he must ultimately know the best flies, and when they should be used.

In fishing on live water, or when it is at all windy, one may use two or even three flies at a time to better advantage than one, for the fish are more apt to see them, and following in their wake, perhaps from curiosity, seize a fly; but in quiet water a small fly, lightly thrown, will prove most killing.

When using more than one fly I always put the "best" in the position of first or second drop on the leader, because the tail or end fly dragging below the surface of the water will impart a skipping, life-like motion to the others.

After hooking a large fish in swift water, either make up your mind to lose him outright, or "snub" him at once by holding the rod before you in nearly a vertical position, and, reeling in the line, test the strength of your tackle to the very utmost, and, if nothing gives way, the fish will soon come worrying to the net. Very few fly-rods are broken in playing fish, if one possesses a good, free-running reel and plenty of line; and, after all, what is the loss of an occasional leader and cast of flies in comparison with that of a big trout?

Trout generally rise to larger and brighter flies in the fall than during the spring or summer; and one of the greatest secrets in fly-fishing is to know just what size of fly to use.

The art of casting is easily acquired, but that of striking or hooking the fish requires a great deal of practice, and very few fishermen become adepts at it. All that can be said upon this subject is: You cannot strike too quickly when a fish rises, but you may strike too hard. An almost imperceptible turn of the rod is quite sufficient to hook the fish if the line is taut. One should avoid drawing his flies up stream against the current, but rather cast across it, drawing the flies toward him by gentle snatches. Most writers on angling recommend casting up stream, because the fish lie with their heads that way; but I have lost more fish by this practice, on account of the line bellying, than I ever brought to net. In any stream, free from overhanging trees and bushes, where fly-fishing is available, one should use fine tackle, and make his casts down stream, right into the swift, foaming water, and his flies, following the course of the natural insects, will drift to just where the fish are waiting for them. In fishing long, still reaches in a stream, or in a lake or pond, where there is wind, make your best casts where the ripples strike the shore, or a ledge of rock, for there the fish will surely be waiting for the natural insects to drift to them.

Trout generally rest in deep, quiet pools during the middle of the day, and are found in quick, shallow water in the morning and evening, at which times they take the fly with greater confidence than at mid-day, although I believe few trout are taken on the surface before sunrise, and seldom if ever when there is a fog upon the water.

SPORTS AND GAMES

Practical Fly-Casting

By JOHN HARRINGTON KEENE

THE observant angler, who has been present at any of the considerable fly-casting tournaments of the past fifteen years, and noticed the admirable performances of many of the competitors, cannot but have been struck by their value as a means of education to the fly-fisherman. Why the interest in such exhibitions seems to have fallen off of late is not easily apparent, and is to be deplored.

The expert casting of the fly, which is one of the chief accomplishments of the angler, should be most assiduously cultivated, and emulation in this, as in all manly sport, is greatly to be desired. The prime value of such competitions lies in the reproduction of conditions which confront the angler on lake and stream. Every fly-fisher knows the various difficulties which beset him, and make his success a triumph when overcome by the deft handling of the rod and line.

If the distance between an angler and the spot he wishes to reach be great, and the way behind him be clear, he uses the overhand cast; and, assuming he is an expert, his line falls straight and with precision exactly where he wishes to lay it. When the banks are overhung with brush and low-spreading branches, the artful underhand cast may be made with effect.

If trees or rocks be immediately behind, preventing the line extending in the rear, the switch cast is resorted to, and this complicated but beautiful evolution carries out the line in a series of rolling loops to the desired spot, without requiring more than a few feet of space behind the caster.

Only those who have mastered the switch can fully appreciate its efficiency on a salmon pool surrounded by high and rocky walls. I have seen a seventy foot cast of the switch kind made when a rock wall of a hundred feet was rising within six feet of the angler, and right at his back.

Under the seal of authority of Major Traherne—probably the premier salmon fisherman of the century—the making of the switch cast may be thus described: In making the switch the line is not lifted out of the water in the first instance, as it is when casting in the ordinary fashion, in which the result would probably be that the fly would either get hung up in the trees or smashed on the rocks. What the angler therefore has to do is to lift the line to the surface of the water by raising the point of the rod, and then drag it through the water in the direction he is standing, carrying the point of the rod behind him as far as such obstructions allow. Then by a sudden down-cast of the rod, the line, as yet having been allowed to rest on the water in front of him, is propelled by just so much force as the length of cast requires. During this process the fly has not been lifted out of the water till the very last inch of the line has preceded it. Whilst the line is propelled it will thus be made to assume a shape somwehat similar to that of a wheel, which diminishes in size as it rolls on its track, beating the surface of the water. The coil, or "loop," as it is commonly called, naturally vanishes at the point the fly reached when the cast is completed.

The Spey cast is rather different, but in many ways equally effectual and useful in like conditions. To make a long Spey cast, the fly-fisher requires a rapid stream to work in, which will, before making every fresh cast, carry his fly down stream to the full extent of his line, taut and straight, the point of the rod being held as low as possible for that purpose. Then by suddenly raising the rod very high the line is lifted out of the water to the extreme end; and without a moment's pause the rod is carried up stream to the left or right (as the case may be) by a rapid motion, but not so rapid as to send the fly too far up stream past the angler, the object being to let the fly strike the water just above where the angler is standing, at which moment the whole of the line is on the reverse or upper side of him. Then with a sweep the line is propelled over—not *along* the surface of the water—after the manner of the ordinary overhand casting.

The wind cast is a modified switch cast, but more simple in its movement. The angler draws his line nearly to his feet, and gives a vigorous downward thrash, which throws the line in a long roll against the wind.

The flip cast is made by taking the fly between the thumb and finger (beware of the hook point!), then bending the rod as a bow, holding a few coils of the line in the fingers of the right hand, which grasps the rod, and letting go of the fly suddenly in the direction required. This cast is especially serviceable when some obscure point is to be reached underneath overhanging branches.

Of course, the neater and more precise each manipulation of the rod is, the more surely is the fly-fisherman rewarded. Good workmanship in angling dignifies fishing into an art, and the satisfaction of the good workman is always in proportion to his skill. Fly-casting is the hardest of the lessons the tyro has to learn, and it is surprising how few there are, even among devoted fly-fishermen, who are really good fly-casters.

Although the basal overhand cast of the fly has been described most fully by such deans of the craft as Stewart, Francis, Pennell, Halford in England, and Green, Hallock, Wells, and many others in this country, I am tempted to add one more simple description of my own practice; and I do it with the more assurance because I find that even experts need reminding at times of the really right way to make this cast. It may be briefly thus described: Advancing to the side of the stream, with the right or left foot forward, the angler stands facing down stream, and drops the fly in the running water. Holding the rod firmly grasped in the right with the thumb uppermost, he draws a few feet of line from the reel with his left hand. A smart jerk of the rod lets out the loose line, and this is repeated with line drawn from the reel till some thirty or more feet is trailing in the water.

He then raises the point of the rod until the angle it assumes is about seventy degrees; then with a swift and increasing movement of the rod, he urges the line back over his head, or left or right shoulder, according to the wind, till the length of line is fully extended behind him. This must be done without jerking the rod, but forcefully and with accumulating speed, till the psychological movement of the extreme limit of the line behind is reached, which will be felt on experiment after a few trials. At this point, when the line is straight out behind and poised and about to descend to the earth—exactly then—the forward impulse is made, and the rod brought forward with a strong and accelerating movement to an angle of the rod and water of about forty degrees. The result should be a clean cast, with the fly falling one imperceptible moment before the snell leader and line. If, however, the psychological moment be anticipated ever so little, the caster will hear a sharp, snapping sound, and will find he has whipped or "popped" off his fly. If it be missed and the forward movement delayed, the cast will be ungraceful and probably fall in a tangle. The arm should not be waved; the motion is from the wrist only.

Casting on a well-mown lawn is excellent practice, and in such case the barb of the hook should be broken off, if one would avoid hooking a promiscuous ear or other prominent feature of an admiring friend. Impromptu tournaments of this kind are very frequent in England, and in the more settled form of competitions between experts they have, with considerable success, been introduced into the programmes of the recent Sportsmen's Exhibitions held in America. The lessons which even an onlooker may learn, as to correct form, are of themselves important, and the writer can bear witness to the keen interest always excited in the contestants and onlookers.

In fishing most of the average trout streams of this country, it is usual to cast down stream. On the slow-flowing chalk streams of Britain, the down-stream anglers would have little sport, and I have found it an invariable rule that, when one can fish up, and not down, the former is far more productive. With the floating flies no movement should be imparted to the lure, but with the ordinary standard flies a slight tremor should emanate from the rod tip, so as to simulate the struggles of a live insect. One hint more: If the fly becomes entangled in the weeds or water grass, or other submerged obstruction, don't pull up against it, but go below, and pull down stream. It will invariably yield to that treatment.

SPORTS AND GAMES

Archery

By HENRY CHADWICK

I DO not propose to preface this chapter with any special remarks on the origin of archery, or to refer to what history relates of "ye anciente sporte." Suffice it to say that Archery, as now practiced, is one of the most fashionable field pastimes of the English aristocracy. The memory of boyhood's days brings to one's mind the familiar nursery rhyme of "A was an archer who shot at a frog"; while later on in life memory's record recalls the valiant deeds of that hero of archery, Robin Hood, so romantically described in Sir Walter Scott's novel "Ivanhoe." In the ancient days archery was a warrior's occupation; now it is simply a healthy outdoor recreation for the leisure class of the community. As American society increases in all the attributes of wealth, we naturally begin to adopt those sports which seem to belong to people of wealth and leisure. Hence the rapid growth of late years of such fashionable outdoor sports as archery, cricket, lawn tennis, and kindred recreative field exercises.

Archery is an expensive pastime, not only in the outlay of time required for practice, but also in regard to the cost of the materials of the sport. The paraphernalia of an archer's complete outfit is financially costly; that is, if he desires to excel in the art and to become an expert, he must possess himself of the very best materials. For instance, a perfectly finished yew or snakewood bow of the best finish and most endurable quality, with its complement of a quiver of model lancewood arrows, will use up a fifty-dollar bill in a very destructive manner; and when the demand for three bows and three sets of arrows—one of each for long range shooting, one for short range, and one for everyday practice — is satisfied, and the necessary accompanying appliances are added, the best portion of a hundred dollars will have been expended. Then there is one's archery club expenses, and these are no small item. In fact, archery is a field sport for people of means and leisure only, and it can therefore never attain to more than a certain and rather limited degree of popularity, and then only in the large and wealthy cities of the country.

Archery is an exercise advantageous to men of sedentary habits, and to the fair sex. It is certainly an excellent field sport for ladies, as it provides them with the very kind of exercise they are most in need of, and that is in giving active play to the arms and chest muscles. It is true that certain class exercises in calisthenic academies will develop the same muscles; but there is quite a difference between the mechanical work of the calisthenic movements and the pleasurable excitement incident to trials of skill on the archery field, with all its picturesque surroundings. In fact, in comparison, the one is work and the other is play, and any form of exercise which is not recreative in its character doesn't amount to much in a sanitary point of view.

Standing in front of the archery target thirty yards distant, and watching the movements of a practiced archer as he grasps his bow, places an arrow in position, and then, with comparative ease, sends it flying into the center of the "gold" of the target, the whole proceeding, with its final result, looks so simple, so easy of attainment, that a casual observer would be apt to think the sport rather too much of the nature of boy's play for men to engage in it. But when the novice tries his hand at this apparently simple act, and realizes, by practical experiment, what difficulties beset him, and what a number of things he has to learn to do before he himself can shoot his arrow into any part of the target at all, still less the "gold" center, his respect for the sport is very apt to increase in the ratio of the number of obstacles to success he encounters in his efforts to test its merits. "It looks so easy, you know."

But it is not easy at all. On the contrary, it gives a man of brains something to reflect upon, something to study up and to analyze, as to cause and effect; and with this naturally comes a hearty respect for the art, and also a love for the sport, for the pleasurable excitement it yields. Any novice in archery will tell you what a thrill of pleasure he experiences when, after weeks of disappointing practice; of blunders in handling the bow and in "nocking" his arrows; of errors from getting into "bad form" in taking up his position to shoot, and, in fact, in practically realizing all the little shocks to one's *amour propre* which a novice is heir to—when, I say, after all this, he strikes "good form," and sees his arrow enter the magic circle of the "gold," and that not by chance, but by the skill which his persevering mastery of the art yields, his exclamation is, "By Jove, you know, I did not think there was so much enjoyment in it." And this is the idea which every learner expresses when he has once passed the outer works of the citadel of archery. Well has the best American writer on archery expressed it in the title he gave his admirable treatise on the sport, "The Witchery of Archery."

To take aim with a bow is a very different thing from aiming with a rifle. In the latter case you shoulder your rifle, run your line of sight along the barrel, and take deliberate aim at your target. In doing this, the steadier your nerve the truer your aim; but the "mind intent" has little comparatively to do with it, inasmuch as your effort is the result of a combination of keen sight, steady nerve, and straight aim. But with the bow it is altogether different. Here the mental work to be done is everything. In archery the word "aim" in the familiar sense applied to a rifle is inapplicable. Experience teaches the practiced archer to aim with his mind, as it were. Like Hamlet's philosophy, "it is in my mind's eye, Horatio." The archer intuitively feels that he has his bow in the right position to send the arrow flying to the center of the target. He looks solely at the "gold" center of the target, and never at his bow or the arrow, as the arrow lies in position, with bow arched ready for the "loose," which sends it flying through the air to the target. It is this *feeling* of your aim, rather than *seeing* it, that is a peculiarity of the art. This feeling is attained only by the familiarity of constant practice. And, by the way, in no field sport does the old saying of "practice makes perfect" apply with such force as in archery. Skill in handling the bow, especially in long range shooting, is only attainable by continuous and persevering practice. There are so many little, but important details to be attended to, which habit alone can train one into, that any regular rule is almost inapplicable. It is all very well to read in your book of instructions that the young archer must do this, that, and the other thing, but it is practical experience in the field that will alone enable him to overcome the obstacles in his path on his way to the goal of success as an expert. The details which the novice must become familiar with before he can send his first arrow into the target, even, are enough to engage all his attention outside of the attainment of that mental schooling which comes from the practical effort to shoot straight.

To hold your bow firmly with your left hand, as if it were in the grip of a vise, is the first letter of the archer's alphabet. The second is to bend your bow to the arrow's head properly, and the third is to "loose" the cord from the finger of your right hand at the opportune moment when your mind is bent on the target. This is the A B C of archery. Then comes the placing of the arrow in position, seeing that it is "nocked" in the right place on the string; that the "cock-feather" is uppermost, and that the tips of your fingers are rightly placed on the cord. When the "right form" for all these details has been attained by the familiarity of constant practice, and they have become a regular habit with you in handling your bow, then you will be fully prepared for the mental study of the situation, and then begins the "headwork of archery," so to speak, and just as you are able to excel in this will you become a skillful archer.

How to "stand at ease" while using your bow is quite an important matter; that is, to stand in a position that feels natural and unconstrained. You do not face the target as you are required to do when shooting with a rifle, but with the left side of your body toward the target, and with your face turned so as to look over your left shoulder. To stand firm is the main object, so as to avoid any varying of the steady position of the left arm as it is extended, with your hand grasping the bow. At first the novice will naturally find this fixed position somewhat irksome; but practice and habit will make it familiar. The left arm, when extended and resisting the pull of the right arm in bending the bow, will be apt to shake and be unsteady at first. To train the arm to steadiness, practice holding out at arm's length a weight equaling that of your bow, but no heavier. Any exercise, too, which will strengthen the muscles of your left arm so as to give your hand a firmer grip of the bow, will be found advantageous. This arm, in fact, is the lever on which your main dependence lies for a correct delivery of the arrow. As it is raised or lowered, so will your arrow fly high or low to the target. If the arm is bent at all, the power to draw the bow to the arrow's head is lessened, and the aim made inaccurate. All these details must be borne in mind in practice. Not one of them must be forgotten. By this means only can a regular habit—the correct form—be attained. Then comes the next important matter of a proper use of the right arm. Here, too, unused muscles come into play, especially those which are brought into action in pulling the bowstring back as far as the length of the arrow will admit of. At first it will feel like a very constrained position, and be one somewhat painful; but as your arm becomes trained to the position, all that disappears. To ladies, who are so generally unaccustomed to exercise of the muscles of the chest and arms, and are consequently weak in that respect, the practice in using the bow comes hard upon them; but its advantage in the strength it imparts repays for all the pain of the training. When you have learned to "pull the string" correctly, you will then have to attend to the comparatively simple matter of letting the cord slip from your fingers. Any one practicing with a bow and arrow, unless the cuticle of his fingers be as thick as that of a day laborer, will have to wear leather finger-tips to prevent blisters on his fingers; and the face of these tips should be sufficiently soft and pliable to allow of the bowstring slipping from them easily. In holding the cord, too, there is but one right way, and that is to let the arrow, as it lies on the cord, be between your first and second finger, the tips of those fingers being held on the cord. To let slip the cord at the right moment is an important point, as a good "loose," as it is called, is very essential in aiding the correct flight of the arrow. Finally, observe this general rule: Stand steady; hold your left arm out straight and firm; look at the "gold" center of the target as you bend your bow, and the moment your eye is on the target, and your bow is bent to the arrow's head, loosen your hold on the cord with a quick but easy motion. If your movements have been correct, and in harmony with the thought in your mind that the arrow should go straight to the center of the target, it is two to one that it will go there.

SPORTS AND GAMES

Baseball

By J. D. CHAMPLIN and A. E. BOSTWICK

A GAME played by eighteen persons, nine on a side, on a field marked with bases, as in the diagram on next page. The players on the side in the field are named the pitcher and the catcher (who together are often called the "battery"); the first, second, and third basekeepers, or basemen; the short-stop; and the right, center, and left fielders. The three last mentioned are called the outfield; the others, the infield. Before the game the two leaders, or captains, usually decide by lot which shall have the choice of innings, and the winner may choose to go to the bat or into the field. In match games the captain of the home club has choice of the innings. The players on the side that goes to the field, who are often called the "outs," take up the positions shown on the diagram. Each baseman generally stands near his base; the other players may vary their positions considerably, except the pitcher, who, while delivering the ball, must stand within certain limits. The rules require more space than our limits permit.

The pitcher now throws the ball toward one of the other side, called the "batsman," who stands at home base. If the batsman strike at the ball without hitting it, he is said to have made a "strike." If the ball is "good"—that is, passes over the home base not higher than the batsman's shoulder and not lower than his knee—it is counted a "called strike," although he make no attempt to hit at it. A strike is also called, as a penalty, on the batsman in certain other cases.

If the ball is not good, and the player does not strike at it, it is said to be a "ball," or a "called ball." All "strikes" and "balls" are called by an umpire, who stands near the batsman and decides each point as it comes up. Two umpires are sometimes necessary. If the player strike the ball, and it fall within the lines in the diagram called the "foul lines," it is said to be a "fair ball," and the player becomes a "baserunner" and immediately starts toward the "first base." If the batted ball be

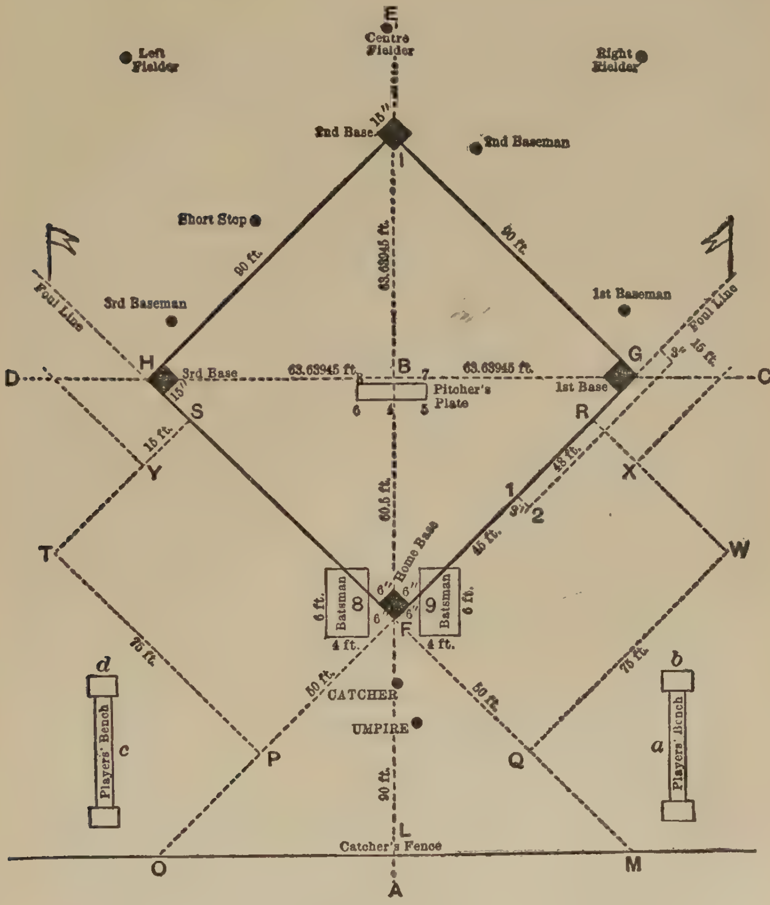


Diagram of Field.

a "ground hit" to the infield, the player getting the ball should throw it quickly to the first baseman. Balls hit along the ground to the outfielders are seldom thrown to first base, because the runner would reach the base long before the ball. It is oftentimes a better play to throw the ball to some other base when there are other runners on base. This will be explained later.

If the batsman can touch first base before the baseman standing on the base catches and holds the ball, the former is said to have "made his base," and remains there; otherwise he is said to have been "put out," and he does not bat again until the eight other players on his side have had their turn "at the bat." If, however, the ball, when struck, instead of being fair, falls outside the foul lines it counts for nothing, unless it be caught on the "fly" by one of the other side, which puts the striker out. The striker cannot make his base on it, and it is neither a strike nor a ball. When a ball is just touched by the bat and flies directly back of the batsman, it is called a "foul tip." Sometimes a foul tip is hard to tell from a simple strike. If three strikes are called by the umpire, the striker must run for his base, and the ball, after it passes the home plate, is treated just like a fair ball struck. If the catcher catches it and holds it, or if he can get it to first base before the batsman, the latter is out. If four balls are called, the batsman is allowed to "take his base"—that is, to run to first base without any hindrance.

Sometimes the batsman so hits the ball that, although he is himself put out, he enables a baserunner to reach another base. He is then said to have made a "sacrifice hit."

When a player either has been put out or has made his base, another one of the same side takes his place as batsman. The striking order is decided before the game, and remains the same throughout. When a baserunner has reached first base, his object is to pass in succession second, third, and home bases, and if he succeed in reaching the last named without being put out, he scores one run for his side. He can be put out, after he has reached first base, by being touched with the ball in the hands of one of the opposite side while he is not touching a base, and in other ways, as told in the rules; but these do not often occur. He cannot be put out while he is standing on a base; but as two players cannot occupy the same base at the same time, he must leave the base before the baserunner following him reaches it. When a player is thus compelled to leave his base, he is said to be "forced." A baserunner usually keeps close to his base while the ball is near him, but when it is in the hands of the pitcher, or the catcher, he "leads off" a short distance toward the next base, so as to be ready to run to it should the batsman strike a fair ball. When a foul ball is struck, all baserunning after the ball leaves the bat is void, and the runners must return to the bases from which they started, retouching the bases they have just left. Sometimes a baserunner can make his next base by leading off and then running while the ball is being thrown by the pitcher to the catcher, hoping to reach the base before the latter can throw the ball to the baseman. This is called "stealing a base." If the ball is thrown to the baseman before the runner makes his base, he may then try to return to his former base, if it has not been occupied by another player. The basemen on each side of him then usually try to put him out by throwing the ball from one to the other, while they walk toward each other, keeping the runner between them till one is near enough to touch him. This is called "running out between bases," but it does not happen often with skillful players. Sometimes, in such a case, the runner will manage to slip past one of the basemen and make his base. In any case where there is a dispute as to whether a man has been put out or not, the umpire decides, as he does in all disputed points throughout the game. Sometimes a baseman, after putting out a man, can get the ball to another base in time to put out a second baserunner; or a fielder, after catching a fly and thus putting the striker out, may throw out a baserunner. These and similar cases are called "double plays." If three men are thus put out, it is a "triple play," but this occurs very seldom. When the catcher lets a ball from the pitcher pass him (called a "passed ball"), and the backstop is placed at ninety feet back of the home plate, the runner may take as many bases as he is able. When the backstop is not so placed, only one base is allowed. Sometimes the batsman will strike the ball so far that he can safely run to second or third base, or even around to home base. In the last case he makes a "home run," while at the same time sending in all the baserunners ahead of him, if any are on base at the time. Thus, by a skillful hit when the bases are "full," a batsman may enable four runners to score. As soon as three players are out the sides change places, and, if no one has reached home base, the score for that inning of the side that has just left the bat is nothing, no matter how many men may be on bases. The game goes on as before with the sides reversed, and when three men of the second side have been put out the first inning is ended. In any inning that man goes first to the bat whose name follows, in the batting order, that of the one who last *completed* his time at the bat (not the one who was out last or the one who went to the bat last) in the previous inning.

The game consists of nine such innings, and the side that scores the most runs is the winner. If the same number of runs has been scored by each side at the end of the ninth inning, a tenth must be played, or more, if necessary, till the game is decided. Each inning is divided into halves, during each of which a different side is at the bat. At the end of an entire inning, when the sides have been at the bat the same number of times, the innings are said to be "even"; but when the side that struck first has been at the bat once more than the other, the innings are said to be "uneven." If the side that would go to the bat last is ahead at the middle of the ninth or any subsequent inning, the last half of that inning is omitted, as it could not affect the result of the game, but only increase the winners' score. Similarly, if the side last at bat scores the winning run before its three men are put out, the rest of the inning is omitted.

If a player reaches his base after making a fair hit, he does so either because he made so good a hit that the best fielding could not have put him out, or because one of the fielders did not do his duty. In the former case, the batsman is said to have made a basehit, or a two, three, or four-basehit, as the case may be; in the latter case, the fielder is said to have made an "error."

Likewise, a fielder that allows a baserunner to make a new base, when he might have stopped him, makes an error. A run made entirely without the aid of errors on the opposite side is called an "earned run." Errors, basehits, and earned runs are scored, not because they count in deciding the result, but because they serve to show whether a game is won by the skill of the winners or the carelessness or bad playing of the losers; and they also show which are the best players on a side. They are more carefully considered under "Scoring."

THE CATCHER

This player usually wears a large glove, made for the purpose, to protect his left hand; a cage, or mask, of strong steel wire over his face, and a padded body protector. When there are no men on any of the bases, and the batsman has less than two strikes, the catcher usually stands back and takes the pitcher's balls on the first bounce, or allows them to strike the high board fence at his rear without trying to catch them. When the batsman has two strikes, the catcher stands close to him (called playing close to, or behind, the bat), so that at the next strike he may catch the ball on the fly, and so put the striker out. When there is a man on any base, he also plays close to the bat, so as to give the baserunner no chance to reach nearer home. He keeps on the lookout to see that no men "steal" bases, and tries to "throw them out" if possible. He tries to catch those foul balls that are struck to the batsman's rear, and any fair balls that fall but a short distance in front of the home plate. When a fair ball falls between catcher and pitcher, or in any other case when it is doubtful which player should field the ball, the captain of the side calls out the name of the one he wishes to catch it. Besides these duties, the catcher generally acts as home baseman.

THE PITCHER

His chief duty is to throw the ball so that the batsman will find difficulty in hitting it. For this purpose he often throws the ball in a curve, so that the batsman is puzzled to know just where it will cross the home plate. This is done by giving the ball a twist as it is thrown. A swiftly moving ball pushes the air in front of it into a sort of elastic cushion, and if the ball is twisting at the same time, the cushion will be a little more elastic on one side than on the other, pushing the ball slightly sideways, and thus making its path a curve. By making the ball twirl in one direction or another, the skillful pitcher can curve it to the right or to the left, upward or downward, so that only a batsman of skill can strike it at all.

It requires considerable judgment to make a curved ball pass over the home plate, for when it leaves the pitcher's hand it seems as if it were going to pass to one side. That the catcher may not be puzzled as well as the batsman, the pitcher makes signals, usually by moving his hand or head, to tell the catcher how the ball is to be curved. When he is pitching the ball, he must not step outside of the lines that determine his position, as laid down in the rules, While engaged in pitching the ball, the pitcher must also keep close watch of the baserunners, trying to put them out by throwing the ball to the bases when they are off their guard. He should also be ready to "back up" the catcher, or stand behind him, when the ball is thrown in from the field to put a runner out at home. Sometimes he backs up the first baseman in like manner. The pitcher must not pretend to deliver the ball without doing so. If he does, he is said to have made a "balk," and the batsman is allowed to go to first base, or the baseunner to advance a base.

The Baseman

The principal duty of the baseman is to guard his base and be ready to put out any baserunner who is trying to make it. The first baseman usually does this simply by catching the ball and touching his base before the runner—the others, in most cases, put the runner out by touching him with the ball before he reaches the base. When, however, the runner is "forced," the basemen need only touch the base before the runner while holding the ball. The basemen also act as fielders, and render assistance, when they can, in backing up other players.

The Fielders

The duty of the fielders is to catch all fair and foul balls they can "on the fly," and to "field," or throw, all balls as quickly as possible to the proper place. This place varies according to the state of the game and the position of the fielder. If there is no man on third base, and there is one on first and one on second base, the ball goes either to second or third base, according to the chances for intercepting the runner. If there is a man on third, the ball is usually thrown to home base, for it is of the first importance to prevent a man's scoring. But if the fielder sees he cannot possibly get the ball to home base in time, he throws it to one of the other bases. Or, if there are already two out, he may throw it to first base, knowing that no matter if there is a man on third base, his run cannot count after the third out. It requires careful judgment in the fielder to know exactly what to do in many cases, and he must decide instantly, as a second's delay might lose the game. An outfielder may be idle during a great part of the game, but he must be ready to act at any moment, and on no account allow a ball to pass him.

The shortstop is an infielder, placed where batsmen are very apt to send the ball, as experience shows.

The batsman tries to send the ball to the place where it is least expected, or where it will be hardest to reach. If he sees that the pitcher is giving him a good ball, he usually strikes at it, for it will be counted as a strike whether he does so or not; but a bad ball he lets pass him, unless he sees that he can make a good hit with it. As soon as the batsman strikes a ball he runs, without waiting to see whether it be foul or fair, returning to his bat if the umpire decides it to be foul. In striking, some batsmen swing the bat, and others merely push it against the ball. Usually the striker steps forward just as he hits, to give more force to his stroke.

The baserunner is usually aided by the advice of a "coach," one of the men on his own side, who must stand outside the fifty-foot line (see diagram). When running for a base a good player often finishes by throwing himself at full length, and sliding toward it, either feet-foremost or head-foremost, thus avoiding the touch of the baseman. Skillful baserunners have signals by which they inform the batsman when they are going to "steal" a base, thus enabling him to hit to better advantage. For instance, if a runner on first base tries to steal second base, the second baseman will run to protect his base, leaving the field open, and a hit between the two bases will be a good one. Much of the success of the game depends on skillful baserunning.

SIMPLIFIED RULES

1. Each side consists of nine players.

2. An inning is complete when three men on the batting side are out. Three men being out constitutes an inning.

3. A game consists of nine innings played by each side.

4. The players go to the bat in regular order: the first man on the list of his side being the first man to bat in the first inning. Afterward the first batsman in an inning is the one next on the list to the third batsman out in the previous inning. But, if a baserunner is the third man retired, and this occurs while a man is at bat, such batsman shall bat first in the succeeding inning.

5. The batsman must not step out of his position, known as the batsman's box, and must strike at every ball delivered by the pitcher that crosses the plate between the knee and the shoulder.

6. If the batsman fails to strike at a good ball so delivered, the umpire must call "one strike."

7. If the batsman strikes at any ball, whether it be a good or bad one, and fails to hit it, the umpire must call "one strike."

8. When the umpire has called "three strikes," the batsman is out, providing the ball constituting the third strike be caught by the catcher before it touches the ground. If the catcher fails to hold the ball, the batsman has an opportunity of reaching first base, but the catcher may recover the ball and intercept the baserunner, by throwing it to first base. If the ball reaches the base before the runner, he is out.

9. If the pitcher delivers a ball which does not pass across

the plate between the batsman's knee and shoulder, the umpire must call "one ball."

10. If the umpire calls four balls, the batsman is entitled to his first base.

11. If the batsman hits the ball so that it falls outside the foul lines, it is a foul hit, and does not count, provided that if a fielder catches it before it touches the ground, the batsman is out.

12. If the batsman hits the ball so that it falls inside the foul lines, it is a fair hit. Any ball hit to ground inside the foul lines is a fair hit, unless it should roll outside the foul lines before reaching first or third base, as the case may be. Any ball hit to ground outside the foul lines which rolls inside the foul lines before reaching first or third base, as the case may be, is a fair hit.

13. The batsman becomes a baserunner immediately he has made a fair hit; immediately after four balls have been called by the umpire; immediately after three strikes have been called by the umpire, provided that the catcher has not held the ball at third strike, as provided in Rule 8; if any part of his person be hit by a ball delivered by the pitcher, unless the hit be upon the forearm; and immediately after the pitcher has illegally delivered a ball.

The batsman is out:—

14. If he fails to take his position at the bat in his order of batting.

15. If he fails to take such position within one minute after the umpire has called for the batsman.

16. If he makes a foul strike. To make a foul strike is to hit the ball when not standing in the batsman's box, as provided in Rule 5.

17. If he attempts to hinder the catcher from fielding or throwing the ball.

18. If, while the first base be occupied by a baserunner, three strikes be called on him by the umpire, except when two men are already out.

19. If, while attempting a third strike, the ball touches any part of his person.

20. If, after two strikes have been called, the batsman obviously attempts to make a foul strike.

21. If the ball struck by him, whether in a fair or foul hit, be caught before touching the ground.

22. If the catcher catches the ball at third strike before it touches the ground.

23. If, after he has made a fair hit, or after the third strike (provided in the latter case that the catcher has not caught the ball before it touches the ground), he is touched by the ball in the hands of a fielder before he has reached the first base.

24. If, after he has made a fair hit, or after the third strike, as mentioned in the preceding rule, the ball is securely held by a fielder who is touching the first base with any part of his person.

25. If, in running the last half of the distance from home plate to first base, he runs outside the three-foot line, unless to avoid a fielder attempting to field the ball.

The batsman is entitled, without being put out, to a base:—

26. When the umpire has called four balls.

27. If the umpire has awarded a base to a succeeding batsman, and the baserunner is thereby forced to vacate the base held by him.

28. If the umpire calls a balk.

29. If the ball, delivered by the pitcher, passes the catcher and touches the umpire or any fence or building within ninety feet of the home plate.

30. If, upon a fair hit, the ball strikes the person of the umpire standing upon fair ground.

31. If the fielder stops or catches a batted ball with his hat or any part of his dress.

The baserunner must return to his base, and is entitled to do so without being put out:—

32. If the umpire declares a foul hit.

33. If the umpire declares a foul strike.

34. If the umpire declares a dead ball.

The baserunner is out:—

35. If, in running from first to second base, from second to third base, or from third base to home plate, he runs more

than three feet from a direct line between such bases, to avoid being touched by the ball in the hands of a fielder.

36. If he in any way obstructs a fielder attempting to field the ball, or intentionally interferes with a thrown ball.

37. If, while the ball is in play, he is touched with the ball in the hands of a fielder, unless some part of his person is touching a base he is entitled to occupy. The ball must be held by the fielder while touching him. In running to first base, he may overrun the base, and will be allowed to return to it without being put out for being off his base. Provided he must return at once and retouch the base, and afterward he may be put out, as at any other base. And if, after overrunning first base, he should attempt to run to second base, or should turn to the left, as though about to do so, he may be put out. To return to and retouch an overrun base, the runner must turn to the right.

38. If he should start to run on a fly ball, and he is touched with the ball after it is caught before he has returned to his base. The baserunner must not run on a fly ball, until it has been momentarily held by a fielder. A fly ball is a ball caught either in fair or foul territory, before it touches the ground.

39. If he is put out when forced to vacate his base under the following circumstances: When the batsman becomes a baserunner, the players occupying the bases in advance of him must vacate those bases in favor of the batsman or succeeding baserunner, and cannot return to such bases unless the batsman is put out at first base. Then they have the privilege of returning to their bases.

40. If he is hit by a batted ball before it touches a fielder.

41. If, when running bases or returning to a base, he fails to touch each intervening base.

42. If, when the umpire calls "play" after any suspension of the game, he fails to return to and retouch the base he occupied when "time" was called.

43. A run is scored by a baserunner running one hundred and twenty yards and touching first base, second base, third base, and home plate in succession.

SPORTS AND GAMES

Basket Ball

By J. PARMLY PARET

BASKET BALL bears a striking resemblance to Association football, and undoubtedly some of its features have been taken from the older game. To remodel it for indoor gymnasium use, of course, many changes were necessary, but the salient points which distinguish the English from American football still remain. The players cannot carry the ball, nor can they kick it, the method of progressing being restricted to passing, batting, or "dribbling" the ball. Tackling, body-checking, and holding are all prohibited, so the action of the game becomes very fast indeed.

In adapting the game to the gymnasium, there was some difference of opinion for some time as to the number of men to be played on a team. The size of the floor space governed the size of the teams at first, and five, seven, or nine men were played on each side. Since then, however, a uniform team of five men has been adopted, and there are few exceptions found to this, even in the biggest gymnasiums. Football goals, too, were impossible in such small space, and the happy substitution of a basket, suspended ten feet from the ground at either end of the floor, did away with much rough play in the defense of the goals.

The game is scored by points, but there are only two methods of making points—goals from the field and goals from free throws. The former may be thrown from any part of the field inside the side lines, and in any way, the mere falling of the ball into a basket counting for the opponents. This kind of a goal counts two points, while a goal from a free throw is scored as one point. This free try for goal is allowed to the team against whom any foul has been committed. It corresponds exactly with the attempt to kick a goal after a touchdown in American football; and the player chosen to throw for the goal stands at a distance of fifteen feet from the goal, and has an unobstructed chance to put the ball in the basket. It counts one point for his side if he scores it, and, if not, the ball continues in play as soon as it falls.

The fouls for which this penalty is allowed may be made in different ways. To run with the ball, to hold it against the body, or to kick it, constitutes a foul, while it entails the same penalty to tackle, push, or hold an opponent, or to shoulder, trip, strike, or kick him. The free throw is the first penalty, but if a player commits a second foul, involving any roughness of play, in the same game, he is disqualified by the umpire, and a substitute put in his place.

The game consists of two halves of twenty minutes each, with an intermediate rest of ten minutes, although time is taken out, as in football, when the referee blows his whistle to stop play for fouls, free throws, or for any other cause of delay. There is an umpire to watch the conduct of the players and judge fouls, a time keeper, and a referee in each game. The referee handles the ball, and the umpire follows the conduct of the players, as in football. The referee starts play at the beginning of each half, and after each goal, in the center of the field, by tossing the ball up into the air for the two center men to jump for. In case of a held ball, he also "faces" the ball in the same way, but at the spot where it was held.

This "held ball" play occurs when two or more players have their hands on the ball at the same time, and it is not passed by one of them immediately.

In case the ball passes out of bounds, it goes to the player who touches it first, and it is put in play again by his tossing it in to some other player of his own team from the side line where it went out. His opponents may not touch the ball while he is holding it, but are allowed to block his pass and regain possession of the ball as soon as it leaves his hands.

A basket ball team is made up of five players, corresponding closely to the forwards, center, and backs of Association football. They act as right and left forwards, the center, and right and left guards. The forwards conduct most of the attack, and it is generally their work to throw the goals while the guards conduct the defense. Each guard "covers" the opposing forward, and stays as close to him at all times as possible. They serve as goal keepers, too, and when the ball is down their end of the field, it is their duty to get possession of it as soon as possible, and pass it to their own attacking men, and, until they can get it, to prevent the opposing forwards from throwing goals.

Once the ball shoots up into the air, if the aim be true, it is practically impossible to stop a goal—the basket hangs so high out of reach. But a good guard never leaves the opposite forward for a second, if the latter has the ball; and as soon as he draws back to try for goal, the guard's arms are spread out to "cover" him as much as possible, and spoil the attempt at goal by intercepting the ball. If the ball does get past him, he turns quickly to watch the result of the throw, and, should the ball miss the basket, to secure possession of it and pass it quickly up the field.

The center closes in toward his own goal when it is in danger, but the instant one of his guards has secured the ball, he stands ready to take it on the pass and send it on to the forwards, either by a second pass or by dribbling it up the field. He acts as the feeder for the attacking forwards, and closes in toward their position when they have the ball, to help them in their work of trying for goals. Frequently, he may find his forwards so well covered that it is almost impossible for him to pass the ball safely to them; and then the center dribbles it up the field a short way, and tries for goal himself as soon as he is near enough for his throw to reach the basket, and he can break from the opposing center's cover. Phenomenal goals are sometimes thrown by the centers in this manner from a long way down the field.

The center is nearly always a tall man, for it is almost invariably his duty to "face" the ball. When the ball is thrown up in the center of the field by the referee at the beginning of each half of the game, and after a goal has been thrown, only the center man of each team is allowed to touch it. Height counts for a great deal at this point, for the man with the longer reach is generally the one to touch the ball in the air first; and he will knock it directly to one of his waiting forwards, or catch it and pass it to them. So the center is commonly the most skillful all-round player on the team, for it falls generally to his share to help both in the attack and in the defense, as well as to face the ball at the start.

The forwards have by far the most interesting positions to play, and on their skill the score of the game often rests. It is not such a difficult matter for the guards and center to get the ball to the forwards, but it is not so easy for the latter to throw the goals after they get the ball. A quick dodger will often break away from the opposite guard, and then, with a sudden turn, get an opening to throw for goal without interference; but he must throw quickly and accurately, or the ball will go wide of the basket, and fall immediately into the hands of the opponents, and be passed back up the field without gain.

There are many different ways of throwing for the goal, all more or less accurate; but the most common, and that used by the great majority of good players, when they are not covered by the opposing guard, is by holding the ball in both hands above and behind the head. A slight spring into the air and a straightening of the arms, with a quick jerk, sends the ball almost straight up in the air over the basket, and, if the aim be true, it falls down into the netting. Occasionally it strikes the iron rim and bounds down again on the floor, to be grabbed up by the waiting guards. This method of throwing sends the ball so straight that the forward must stand within eight or ten feet from the basket when he throws, but it has the distinct advantage of being very difficult to cover or block.

One of the first things a good guard must learn, however, is to block such a throw by spreading both arms up over the thrower's head and intercepting the ball when it leaves his hands. Frequently a forward will find his attempt covered in this way, and then, turning quickly, throw underhand under the arm of the guard, or dodge to one side and throw past him. A clever forward learns to throw for the basket from almost any position, and he dodges quickly this way and that, bending over, or straightening up, until he gets an opening to shoot the ball past his blocking antagonist. Sometimes, he turns his back entirely and throws over his head; again, he bends down and throws underhand from either side, and I once saw a clever forward, who seemed to be completely covered, stoop down and shoot a goal from between the guard's legs.

One can easily see from the work of the players, that basket ball requires the most rapid kind of play. The action is always fast, as the ball cannot be held more than five seconds at a time, and the changes sometimes occur with kaleidoscopic quickness.

The center on the reds bats the ball, when the referee tosses it up, to one of his forwards, who makes a quick pass to the other, as the opposing guard hurries over to prevent his throw for goal. Then, two or three quick dodges, and the ball shoots out of his hands, only to be blocked by the other guard. Perhaps the other forward picks it up, and has a clean try for goal, but misses the basket by a few inches; then the blue guard gets the ball and runs two or three steps with it, dribbling it along as he goes, and then passes it to the center, who passes it along, by similar play, to the other end of the field, for his forwards to try their hand at goal throwing. Perhaps they fail, too, as their opponents have just failed, and the ball is shot back up the field again.

In a fast game, where the players are evenly matched, this is often kept up for ten minutes steadily, without either side being able to score, and the ball shifts continually from one end of the field to the other, so fast, the eye can hardly follow it. Perhaps it goes out of bounds once or twice during this period, but no time is lost. The player who touches it first, picks it up at once, and it is passed back into the field of play almost without intermission. When a foul is announced by the blowing of the umpire's whistle and the players line up for the free-throw-for-goal penalty, or when a goal is thrown from the field and the players take their original positions on the field again for the ball to be put into play once more, the spectators see the only rest the players get from their quick, continuous action.

When the first half is over, only twenty minutes after the game started, you can see the players walk into the dressing-rooms and put on sweaters to keep from chilling off, and every one of them is covered with the healthful sweat of fast physical exercise. In nine cases out of ten, you will find them breathing heavily, and very ready to lie down and rest for the only too short ten minutes of respite before the whistle calls them once more out to begin play again. Basket ball is a fast game, and an exhausting one. It takes strong legs, strong backs, and strong arms to keep up the vigorous exercise of a fast match, and careful training is necessary if one would not "come short of wind" long before the game is over. Every muscle of the body is brought into use, and quick eyes are needed to follow the ball in all its rapid changes.

"Keep your eye on the ball" is the constant cry of the captain in basket ball, just as it is in baseball. The player who can do this, and follow his opponent and cover him constantly, is the most valuable man a captain can have to depend on. And in these two qualities lie the greatest skill on a basket ball field.

Attempts have been made by several enthusiastic clubs to play basket ball outdoors, and in one part of Brooklyn's Prospect Park, a public basket ball field has been laid out for the sport. Here the game differs a little, in that the baskets are held up on posts set in the ground at either end of the field, and the side lines are marked upon the grass. Perhaps the fresh air makes the game a trifle more healthful, but such severe exercise as fast basket ball requires could not be well undertaken in the heat of a summer sun. It is primarily a game for indoor winter use in the gymnasium, and its adaptation to outdoor conditions has not met with the approval of those at the head of the sport.

Women have taken kindly to basket ball, and with quite as much enthusiasm as men. Although their matches are not nearly so fast in play, the girls in some of the colleges understand the fine points quite as well as their brothers.

The physical training-schools for women all recommend the game as an excellent form of exercise for their pupils who are organically sound, and it is played constantly in their gymnasiums. Both Dr. Sargent's school in Cambridge, Mass., and Dr. Anderson's in New Haven, Conn., are represented by regular teams of girls, who play matches each winter. Vassar, Bryn Mawr, Smith, and Wellesley colleges for girls have also taken it up in their gymnasiums, and the girls show more enthusiasm over basket ball than any other form of physical exercise.

SPORTS AND GAMES

Bowling

By J. D. CHAMPLIN and A. E. BOSTWICK

THE game of bowls, originally played on smooth turf, but now more generally on long, narrow platforms called alleys. The alleys, about sixty feet long and four feet wide, are usually constructed of narrow strips of yellow pine, set edgewise, and made very smooth and nearly level. At the lower end is a depressed space, commonly floored with tanbark or sawdust, and padded at the back to break the force of the balls, which are returned to the players by an attendant. The pins used are about fifteen inches around at the thickest part, and fifteen or sixteen inches high. Balls (bowls) are of different sizes, to suit the taste of the players, varying from five to ten inches in diameter.

Ten pins is the game of bowls most common in the United States. The pins, ten in number, are set up on spots arranged in a triangle.

The pin at the point of the triangle, which is toward the player, is called the King Pin. The players take turns, and continue to bowl in the same order during the game, which lasts until each has had ten turns. Each player scores one point for every pin he knocks down, and is allowed to bowl three balls in each turn, unless he knocks down all the pins before he has used that number, in which case his play ceases. If he overturn them all with one ball (called making a "ten strike") he is said to have a "double spare," and whatever he makes with the first two balls in his next turn counts on the former turn as well as on the latter. Thus, if a player makes ten with his first ball, he stops playing. If, in his next turn, he makes with the three balls four, two, and three respectively, he scores sixteen for his first turn and nine for his second, the four and two counting twice. If the first ball of the second turn also makes a ten-strike, then the first of the third turn counts as part of each of the three turns. If the pins are down after two balls have been played, the player has a "single spare" or "spare," and reckons in the same way what he makes with the first ball of his next turn. If a spare or double spare be made in the tenth turn, the player rolls one or two extra balls. If a player make a spare, a cross is marked opposite his score for that turn; if he make a double spare, a double cross is used. This way of scoring, which is sometimes called "counting old and new," is generally used, but the players may agree on any other; for instance, if a player make a ten-strike, the pins may be set up again and he may finish rolling his three balls before the next player takes his turn.

The scores are usually kept with chalk on blackboards at the side of the alleys. He wins whose score is the highest at the end of the game. The players may be divided into two sides, in which case the points made by those on each side are added to determine the winning side. Where there are two alleys the players use them alternately, and the pins are set up on one alley while bowling is going on at the other. Where there are only two players they often bowl at the same time on different alleys, but they should change alleys at the end of each game.

The following rules are substantially those of the Amateur Athletic Bowling League, which have been adopted also by the Amateur Athletic Union. Those relating merely to matters of discipline have been omitted:—

1. The game adopted to be played by clubs belonging to this League shall be what is known as the American Ten Frame Game.

2. In the playing of match games, there shall be a line drawn upon the alleys sixty feet from the head, or front pin.

3. In the playing of match games, any wooden ball may be used that does not exceed twenty-seven inches in circumference.

4. The game shall consist of ten frames on each side, when, should the number of points be equal, the play shall be continued until a majority of points upon an equal number of frames shall be attained, which shall conclude the game. All strikes and spares made in the ten frames shall be completed before leaving the alley and on same alley as made.

5. In playing all match games, ten players from each club shall constitute a full team.

6. Players must play in regular rotation, and after the first inning no changes can be made except with the consent of the captains.

7. In match games, two alleys only are to be used; a player to roll but one frame at a time and to change alleys every frame.

8. The umpire shall take great care that the regulations respecting the balls, alleys, and all rules of the game are strictly observed. He shall be the judge of fair and unfair play, and shall determine all disputes and differences which may occur during the game.

9. In all matches, the umpire shall be selected by the captains of the respective teams, and he shall perform all the duties in Rule 8, except recording the game, which shall be done by two scorers, one of whom shall be appointed by each of the contending clubs.

10. Neither umpire, scorer, nor player shall be changed during the match, unless with the consent of both captains, except for reasons of illness or injury, or for a violation of these rules, and then the umpire may dismiss any such transgressors.

11. No person except the captains shall be permitted to approach or speak with the umpire, scorers, or players during the progress of the game, unless by special request of the umpire.

13. Should either club fail to produce its players within thirty minutes after the game is called, the club so failing shall admit a defeat, and the game shall be considered as won, unless the delinquent club fail to play on account of the recent death of one of its members, and sufficient time has not elapsed to enable them to give their opponents due notice before arriving at the place appointed for the match.

14. A player must not step on or over the line in delivering the ball, nor after it has been delivered, until it leaves the alley. Any ball so delivered shall be deemed "foul," and the pins (if any made on such ball) shall be placed in the same positions as they were before the ball was rolled. It is also considered a foul ball, if any part of the person should touch any part of the alley beyond the line before the ball leaves the alley. All foul balls shall count as balls rolled.

15. Should any ball delivered leave the alley before reaching the pins, or any ball rebound from the back cushion, the pins, if any, made on such ball shall not count, but must be placed in same position as they were before the ball was rolled. All such balls to count as balls rolled.

16. In all match games, two persons to act as judges shall be chosen, one by each captain, who shall take their positions at the head of the alleys and see that the pins are properly set up, and that no one interferes with them in any way until the player is through rolling. They will immediately report to the captains any irregularities that they may notice during the game.

24. A regulation pin must be used in match playing. Each pin to be from fifteen to sixteen inches in length, fifteen inches in circumference at the thickest part, and two inches across the bottom.

26. In match games, the dead wood must be removed from the alley after each ball. Should a pin fall on the removal of the dead wood, it is to be re-spotted.

27. Sufficient space shall be allotted to the participants in the game, to which none but members of the teams shall be admitted.

SPORTS AND GAMES

Canoeing

By J. D. CHAMPLIN and A. E. BOSTWICK

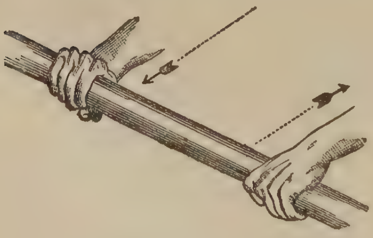
CANOES are light boats, sharp at both ends, and propelled by a paddle, the boatsman looking toward the bow. Pleasure canoes, in general, are of two kinds: paddling canoes and sailing canoes. Canoes may be built of bark, skins, canvas, paper, wood, or metal. The length of open canoes varies from ten to seventeen feet, the breadth from two to three feet, and the depth is eight or nine inches. The paddler kneels on a cushion on the bottom of the canoe. The decked canoe usually has a keel and ribs of oak and bulkheads, near either end. It has a board floor, a seat for the paddler, and movable back and footboards. The double-bladed paddle is of pine or spruce, from six to twelve feet long, and jointed in the center, for convenience of stowage and to aid in feathering.

To enter a canoe without upsetting requires caution. It is best to place one foot on the bottom, then one hand on either gunwale, then both feet on the bottom, and sit down as soon as possible, bearing most of the weight on the hands until seated. The paddle is held in both hands, and the boatman dips the blade so as nearly to cover it, as far forward as he can reach on one side of the boat, and then draws it steadily back, thus propelling the boat. With a single paddle all the strokes are on the same side of the

Canoe Paddles.

boat, till the paddler changes for rest, and the boat is steered by giving the paddle a twist at the end of the stroke. With the double paddle the strokes are made on alternate sides, thus keeping the course straight. The unused blade will be in position to make the second stroke when the first is finished. The blades of a double paddle are usually set at right angles so that the one not in the water will always cut edgewise through the air, and the wrist must therefore be turned slightly just before putting the blade into the water. Short paddles must be held almost perpendicularly in the water. The paddle can be managed better by sitting high, but there is more danger of upsetting. In racing, the seat is generally placed nearly on a level with the deck. In order to be prepared for an upset, the canoeist should practice falling out and getting into his place again from the water. He must dress lightly, and should not attempt to paddle a canoe without knowing how to swim. In canoe races, "upset races" are often included, where each contestant is required, at a given signal, in the course of the race, to overturn his canoe, scramble in from the water, and go on to the finish.

Canoeist Using Double-Bladed Paddle.



Method of Holding Double-Bladed Paddle.

The sailing canoe has either a keel or a centerboard, which is now often made to fold up like a fan when not in use. The sail may be either the lug, leg-of-mutton, or lateen (see Sailing). The masts are very light, and can be taken down in a moment. The yard and boom are generally of some light wood. The rigging is as simple as possible, and so arranged that the canoeist need not leave his seat to work it. There is usually a rudder, managed with foot steering gear when the canoeist sits or lies in the bottom, as formerly in England; but in this country usually by a tiller fastened to a yoke near the hatch, where it is close at hand. The English have now generally adopted the American plan. The rudder should be hung so that it will extend below the keel and keep its hold on the water, even when the canoe lifts her stern clear at every wave.

In England canoeists generally lie down in the bottom of the canoe, while in this country they sit on deck, except when sailing before the wind. Canoe sailing differs in some respects from ordinary boat sailing. If the canoeist cannot hold his boat upright by his own weight, he should "luff" so as to ease her a little, and if that does not answer, he should slack the main sheet. If it blows very hard, he should take in sail altogether.

Many canoes have sliding seats, made in two pieces, the upper slipping sidewise over the lower to either side, so that the crew can sit away out to windward and balance the boat in a far heavier wind than would otherwise be possible. In tacking, the canoeist throws his weight forward and to leeward, shifting it as the canoe passes the wind's eye. Gybing is more dangerous in a canoe than in a sailboat, the canoeist being obliged to shift his weight suddenly to avoid overturning. More than one hundred pounds of ballast may be carried in a sailing canoe, in bags of about twenty-five pounds each. As much as one hundred and seventy-five pounds was formerly carried, but at present the most expert canoeists rarely carry ballast when racing.

Unless a canoe is very well ballasted, sail should never be kept on it when the sea is high enough to break on board. The canoe should never be allowed to get broadside to the wind, except when it is absolutely necessary, as in turning. In heavy water, the course should be zigzag, and heavy seas must be dodged. If it is necessary to take a wave, it must be done with the end of the canoe toward it, and the canoe should be allowed to slide sidewise down the back of the wave. In running before the wind, the canoeist removes the back board, and, when it is necessary, stops the canoe's headway by back strokes of the paddle. If the bows run under water, the halyards must be let go at once. The paddle should always be ready for use, and it is well to have a cork belt at hand. If the canoe should capsize, the canoeist must climb over it, let go the main halyard, haul on the down-haul, and get the mainsail on deck, before trying to right the craft. In beaching a canoe, the sail must first be taken in, the rudder triced up, and the hatch taken off. The canoeist then leaps out into shallow water with the painter, and hauls the boat on shore.

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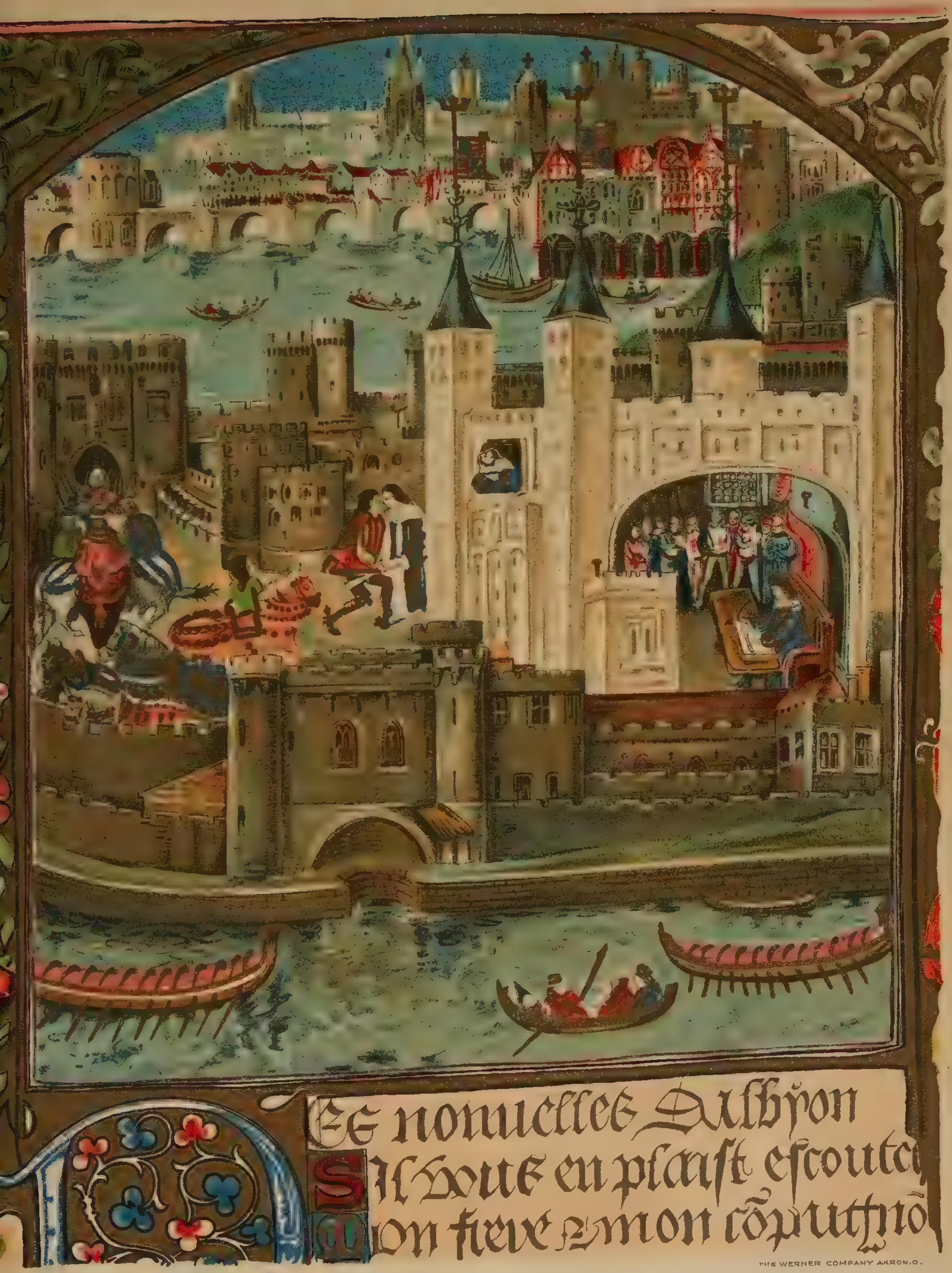

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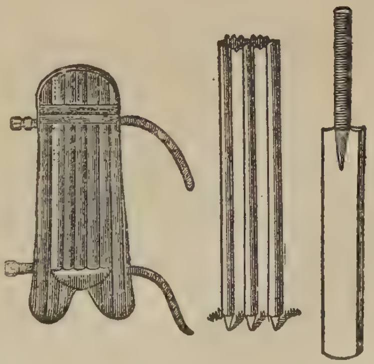
SPORTS AND GAMES

Cricket

By J. D. CHAMPLIN and A. E. BOSTWICK

THIS is the English national game, and is played by twenty-two persons, eleven on each side. Two "wickets" are set up, twenty-two yards apart, each consisting of three upright sticks called stumps, twenty-seven inches high, so close together that the ball cannot pass between them. Across the top of each wicket are placed two pieces of wood called bails. In front of each wicket, and four feet from it, is a line marked on the ground called a popping crease, and in line with each wicket is a bowling crease similarly marked, six feet eight inches long, having at its end short lines at right angles to it, called return creases. The choice of innings is generally decided by lot, and the game is then begun by the players of the side that has the field taking positions round the wickets, while two of the other side take position, one in front of each wicket, inside the popping crease, with bats like those in the illustration. The duty of each of these players, who are called batters, is to keep himself from being put out, as explained below, and to make as many runs as possible.



1. Pad. 2. Wicket. 3. Bat.
Cricket Implements.

The players on the fielding side take whatever positions in the field their captain directs. There are always a bowler and a wicket keeper, but the positions of the other men vary with the opinions of the captain and the changes of the bowling.

The bowler begins play by delivering the ball at the opposite wicket, standing with one foot behind the bowling crease. The batter tries to protect the wicket by striking the ball with his bat. If the ball neither is struck nor hits the wicket, the wicket keeper returns it to the bowler. If any part of the wicket is knocked down, the batter is "out," and another takes his place, and so on in an order decided on by the captain of the batting side. If the player strike the ball far enough he may run to the opposite wicket, changing places with the batsman there, who runs at the same time with him. If the two cross the popping creases of the wickets toward which they run, or put the bat inside them before either wicket is knocked down (either by the ball thrown by a fielder or by a fielder with the ball in hand), they together score one run. Otherwise the one who leaves the knocked-down wicket is out, unless they have crossed, when he who approaches it is out. The players may make as many runs as they can, crossing to and fro several times, and scoring one for each run. A player who is out takes no farther part in the game until all on his side are out. The side wins which makes the greater number of runs in two innings, or sometimes in one inning, if it be so agreed. An inning is completed when both sides have been at the bat and have been put out. When the bowler has bowled a certain number of balls (generally five in England and Canada, and six in the United States) at one wicket, the umpire calls "over," and the next "over" is bowled at the opposite wicket, the fielders all changing their places correspondingly.

Besides the ways of putting out the batter that have been mentioned, he may be put out by a fielder's catching and holding the batted ball before it strikes the ground, by his knocking down his own wicket, when in the act of playing the ball, stopping the ball with his body, or in other ways described in the rules below. The batsman and wicket keeper, when playing against fast bowling, generally have the legs protected by guards, and wear buckskin gloves. The size of the bats and ball is regulated by the first and second rules below. The duties of some of the players will now be described in detail.

The Bowler

The bowler is the most important player on the field. He sometimes varies his balls, like the pitcher in baseball, delivering some fast, some slow, some with one twist and some with another, so as to puzzle the batter. But as a rule, a fast or slow bowler will stick to his particular style, as his field is set for that style only, and a change of even one ball might prove expensive. The ball usually bounds once, after its delivery, and the place where it bounds is called the "pitch." If the ball is pitched close to the batsman, it is called "full-pitched"; if it pitches sooner than a full pitched ball, it is "short-pitched," and if later, "over-pitched." A ball that does not hit the ground before reaching the batsman it called a "full ball." A short pitched ball, reaching the wicket by a long bound, is a "long hop"; an over-pitched ball, which can be hit back or "driven," is a "half volley"; one that strikes the ground just where the batsman's bat is, is a "yorker," and one which keeps close to the ground after it pitches, is a "shooter." One which bounds several times is a "grounder" or "sneaker." Grounders and full balls are too easily played by good batsmen to be used often, but are sometimes effective. If the bowling be fast, the ball will move in almost a straight line from the bowler's hand to the pitch; if slow, in more or less of a curve. In underhand bowling, formerly more used than now, the ball rises from the bowler's hand in a very decided curve. This is called "lobbing." The different twists given the ball make it bound high or low, or to one side, as the bowler may wish, the ball rolling slightly on the ground during the instant it touches it, and so varying its direction as it rises. The bowler suits his balls to the batsman, trying to give him those hardest for him to play. He should hold the ball with his fingers, not in the hollow of the hand, take a short run before delivering the ball, and "pitch" it as near to the batsman as the latter's style of hitting will allow. If the bowler send the ball outside the limits of the opposite bowling crease, it is a "wide ball"; if he does not follow the rules in delivering it, it is "no ball," and in either of these cases, when the umpire so calls it, at least one run is scored for the opposite side (see Rule 13). After an "over" has been bowled by one player, another bowler takes his turn. Sometimes the same player acts as bowler and wicket keeper alternately. If an "over" is bowled without a run being made, it is called a "maiden over" or "maiden." Besides delivering the ball, it is also the bowler's place to watch for chances to put the batsman out at the wicket near which he stands.

THE BATTER

The batter wears leg pads and gloves, both of which should fit easily. He should select a bat to suit his size, and should practice with the same one with which he intends to play in a match. Heavy bats send the ball farther than light ones, when given the same speed, but as it requires greater strength to give them that speed, the batter, when in doubt as to weight, should choose the lighter of two bats. The batsman should stand easily, with his two heels not more than a few inches apart. Before the bowler delivers the ball the batter should "take guard," in readiness for it. The stump nearest the batter is called the "leg stump," the other outside one the "off stump," and the third the "middle stump." If the batter hold his bat directly before the middle stump, he is said to "take middle," if in front of both the middle and leg stumps, to "take middle and leg" for guard. The bat should be held about three inches inside the popping crease. The right or "pivot" foot should be placed as near as possible to the wicket without being in the way of any part of it. The object of thus taking guard is to find out where to place the feet so as best to guard the wicket with the bat.

As the bowler begins to run before delivering the ball, the batter straightens himself, raising his bat slightly, and when the ball is delivered he draws the bat back to the bails of the wicket, where he holds it till he is ready to strike. If he lean slightly toward the wicket, in striking, he is said to "play back," while if he lean toward the ball he "plays forward." In general the former is better, especially for learners, as it gives a longer time to see the ball. The skillful batter plays forward or back according to the way in which the bowler gives him the ball, and the beginner can best learn by experience which to do in any case. In general, he should so bend his body that the bat strikes the ball about one-fourth the length of the blade from its end; that is, in the thickest part. When the batsman "has command of the pitch," that is, can nearly reach with his bat (held straight) the spot where the ball bounds, he should play forward, always holding the bat close to the ground, so that the ball will not go underneath as it rises from the bound. The reason for playing such balls forward is that any twist the bowler may have given the ball, that it may bound in an unexpected direction, has not time to act. The hits which a batter may make are given different names, according to the direction and manner of striking the ball. If it is hit toward "point," "cover point," or into the "slips," it is a "cut"; if it is hit forward on the "half volley" it is a "drive"; if it is hit to the "on side" back of the wickets, it is a "leg hit," and if it is sent in this direction by allowing the ball to hit the bat, it is a "draw."

The batter at the opposite wicket should be ready to run, but must be careful not to do so till the ball is out of the bowler's hand. He may get a start by beginning to run as soon as the ball is delivered, but should not go so far that he cannot return in time to save his wicket, if no hit is made. Neither need run unless he wishes, but if one runs the other must, otherwise a wicket would be left unguarded. It is best for the batter to decide whether to run, when the ball is hit in front of the wicket, and for his partner to decide when the hit is behind the wicket.

THE WICKET KEEPER

This player always wears leg pads and gloves. He stands in a stooping position behind the wicket, varying his distance from it according to the swiftness of the bowling, but he must not stand over it, or with hand or foot in front of it, till the ball has passed the wicket or been struck. After that he may stand where he chooses, but if the batsmen are running he should so stand that the ball will be thrown in to him over the wicket, which he will thus be able to put down without turning around. He should also be on the watch for a chance to put down the wicket when the batter is not on his ground (called "stumping out '). As soon as he receives the ball from the bowler he should return it easily. If the wicket keeper allow a ball that has not hit the bat to pass him, and so give the batsman a chance to make a run, such a run is called a "bye." If the ball hit the batsman's person (not his bat or hand) and he make a run, it is a "leg bye." As the wicket keeper has a better view of the field and the ball than any other player, he is generally the captain of the team, and directs, or communicates with the other fielders and the bowler, by a system of signs previously agreed upon.

Point is the most important of the remaining fielders, as he has more chances for catches than the others. In case of a hit, he often "backs up" the wicket keeper, or, if it is a long one, runs out toward the fielder nearest the ball, in case there should be a short throw.

The duty of the longstop is principally to prevent byes. When the batsmen are not running he returns the ball to the wicket keeper, but in case of a run he sometimes throws to the bowler in hope of putting a man out at the opposite wicket. Sometimes he throws directly at the nearest wicket, where there is no other chance of putting it down quickly. Of late years, owing to the increasing skill of wicket keepers, the custom of playing a man in this position has been almost entirely given up, the extra man thus gained being used elsewhere. The positions of all the fielders are varied by the captain in many ways to suit different styles of bowling and striking, so that the field looks quite differently at one time and another. Only the bowler, wicket keeper, and longstop keep about the same places. These changes of position are directed by signs from the captain.

Rules for Scoring

The runs are kept by making opposite the player's name marks, which are summed up in the "total" column after he is out. Abbreviations often used in the "out" column and elsewhere in the score are:—

b.	bowled
c.	caught
st.	stumped
l.b.w.	leg before wicket
h.w.	hit wicket
w.	wides
n.b.	no balls
B.	byes
l.b.	leg byes.

The runs made, or allowed, for wides, no balls, byes, and leg byes are kept separately at the bottom of the score, and added to the grand total for the innings. In the out column the name of the person who put the batsman out is always mentioned, and if he was caught out, the bowler's name is also put down, since his bowling contributed to the result.

The right half of the score card consists of a bowling analysis, which is made as follows: Opposite the name of each bowler a record is kept of each of his balls. If it results in neither a run nor in putting down a wicket, it is recorded by a dot; if runs are made from a ball, the number of such runs appear in place of the dot. If a wicket is put down, the letter w is put in place of a dot. "Wides," and "no balls" are kept record of by themselves, and all are footed up at the close of each inning. Thus a "maiden over" appears thus—::: (or :.: if only five balls are allowed). An over where two runs were made from the second ball and none from the third would be $:\overset{2}{.}:$ on the record. If the last ball put down the wicket, it would be shown by the mark $:\,:\overset{.}{\text{w}}$. Sometimes, in case of a maiden over, the letter m is made by joining the dots, so that maidens can be counted up more quickly in running the eye over the record.

RULES OF CRICKET

The following are the rules of cricket as adopted by the Marylebone Cricket Club of London; they contain the latest revisions and the famous alterations of 1889. These rules govern the play of all matches in England and Australia. In the United States they are generally followed, except that six balls instead of five are bowled to the over. The Cricketers' Association of the United States has adopted certain modifications of the M. C. C. rules, but in no case are the changes of much importance.

1. A match is played between two sides of eleven players each, unless otherwise agreed to; each side has two innings, taken alternately except in the case provided for in Rule 53. The choice of innings shall be decided by tossing.

2. The score shall be reckoned by runs. A run is scored:—

(1) So often as the batsmen, after a hit, or at any time while the ball is in play, shall have crossed, and made good their ground, from end to end. (2) For penalties under Rules 16, 34, 41, and allowances under 44. Any run or runs so scored shall be duly recorded by scorers appointed for the purpose. The side which scores the greatest number of runs win the match. No match is won unless played out or given up, except in the case provided in Rule 45.

3. Before the commencement of the match two umpires shall be appointed, one for each end.

4. The ball shall weigh not less than five ounces and a half, nor more than five ounces and three-quarters. It shall measure not less than nine inches, nor more than nine inches and one quarter in circumference. At the beginning of each innings either side may demand a new ball.

5. The bat shall not exceed four inches and one-quarter in the widest part; it shall not be more than thirty-eight inches in length.

6. The wickets shall be pitched opposite and parallel to each other at a distance of twenty-two yards. Each wicket shall be eight inches in width and consist of three stumps, with

two bails upon the top. The stumps shall be of equal and sufficient size to prevent the ball from passing through, twenty-seven inches out of the ground. The bails shall be each four inches in length, and when in position on the top of the stumps shall not project more than half an inch above them. The wickets shall not be changed during a match, unless the ground between them become unfit for play, and then only by the consent of both sides.

7. The bowling crease shall be in a line with the stumps; six feet eight inches in length; the stumps in the center; with a return crease at each end, at right angles behind the wicket.

8. The popping crease shall be marked four feet from the wicket, parallel to it, and be deemed unlimited in length.

9. The ground shall not be rolled, watered, covered, mown, or beaten during a match, except before the commencement of each inning and of each day's play, when, unless the inside object, the ground shall be swept and rolled for not more than ten minutes. This shall not prevent the batsman from beating the ground with his bat, nor the batsman nor bowler from using sawdust in order to obtain a proper foothold.

10. The ball must be bowled; if thrown or jerked the umpire shall call "no ball."

11. The bowler shall deliver the ball with one foot on the ground behind the bowling crease, and within the return crease; otherwise the umpire shall call "no ball."

12. If the bowler shall bowl the ball so high over, or so wide of the wicket, that, in the opinion of the umpire, it is not within reach of the striker, the umpire shall call "wild ball."

13. The ball shall be bowled in overs of five balls from each wicket alternately. When five balls have been bowled, and the ball is finally settled in the bowler's or wicket keeper's hands, the umpire shall call "over." Neither a "no ball" nor a "wide ball" shall be reckoned as one of the "over."

14. The bowler shall be allowed to change ends as often as he pleases, provided only that he does not bowl two overs consecutively in one inning.

15 The bowler may require the batsman at the wicket

from which he is bowling to stand on that side of it which he may direct.

16. The striker may hit a "no ball," and whatever runs may result shall be added to his score; but he shall not be out from a "no ball," unless he be run out or break Rules 26, 27, 29, 30. All runs from a "no ball" otherwise than from the bat shall be scored "no balls," and if no run be made, one run shall be added to that score. From a "wide ball" as many runs as are run shall be added to the score as "wide balls," and if no run be otherwise obtained one run shall be so added.

17. If the ball not having been called "wide" or "no ball" pass the striker without touching his bat or person, and any runs be obtained, the umpire shall call "bye"; but if the ball touch any part of the striker's person (hand excepted), and any run be obtained, the umpire shall call "leg bye," such runs to be scored "byes" and "leg byes" respectively.

18. At the beginning of the match and of each innings, the umpire at the bowlers' wicket shall call "play"; from that time no trial ball shall be allowed to any bowler on the ground between the wickets, and when one of the batsmen is out, the use of the bat shall not be allowed to any person until the next batsman shall come in.

19. A batsman shall be held to be "out of his ground," unless his bat in hand or some part of his person be grounded within the line of the popping crease.

20. The wicket shall be held to be "down" when either of the bails is struck off, or if both bails be off when a stump is struck out of the ground. The striker is out—

21. If the wicket be bowled down, even if the ball first touch the striker's bat or person: "Bowled."

22. Or if the ball from a stroke of the hand or bat, but not the wrist, be held before it touched the ground, although it be hugged to the body of the catcher: "Caught."

23. Or if in playing at the ball, provided it be not touched by the bat or hand, the striker be out of his ground, and the wicket be put down by the wicket keeper with the ball or with hand or arm with ball in hand: "Stumped."

24. Or if with any part of his person he stop the ball,

which in the opinion of the umpire at the bowler's wicket shall have been pitched in a straight line from it to the striker's wicket and would have hit it: "Leg before wicket."

25. Or if in playing at the ball, he hit down his wicket with his bat or any part of his person or dress: "Hit wicket."

26. Or if under pretence of running or otherwise, either of the batsmen willfully prevent a ball from being caught: "Obstructing the field."

27. Or if the ball be struck or be stopped by any part of his person and he willfully strike it again, except it be done for the purpose of guarding his wicket, which he may do with his bat, or any part of his person except his hands: "Hit the ball twice." Either batsman is out—

28. If in running or at any other time while the ball is in play he be out of his ground and his wicket be struck down by the ball after touching any fieldsman, or by the hand or arm with ball in hand of any fieldsman: "Run out."

29. Or if he touch with his hands or take up the ball while in play, unless at the request of the opposite side: "Handle the ball."

30. Or if he willfully obstruct any fieldsman: "Obstructing the field."

31. If the batsmen have crossed each other, he that runs for the wicket which is put down is out; if they have not crossed, he that has left the wicket which is put down is out.

32. The striker being caught, no run shall be scored. A batsman being run out, that run which was being attempted shall not be scored.

33. A batsman being out from any cause, the ball shall be "dead."

34. If a ball in play cannot be found or recovered, any fieldsman may call "lost ball," when the ball shall be "dead"; six runs shall be added to the score; but if more than six runs have been run before "lost ball" has been called, as many runs as have been run shall be scored.

35. After the ball shall have been finally settled in the wicket keeper's or bowler's hand, it shall be dead; but when the bowler is about to deliver the ball, if the batsman at his

wicket be out of his ground before actual delivery, the said bowler may run him out; but if the bowler throw at that wicket and any run result, it shall be scored "no ball."

36. A batsman shall not retire from his wicket and return to it to complete his innings after another has been in, without the consent of the opposite side.

37. A substitute shall be allowed to field or run between wickets for any player who may during the match be incapacitated from illness or injury, but for no other reason, except with the consent of the opposite side.

38. In all cases where a substitute shall be allowed, the consent of the opposite side shall be obtained as to the person to act as substitute, and the place in the field which he shall take.

39. In case any substitute shall be allowed to run between wickets, the striker may be run out if either he or his substitute be out of his ground. If the striker be out of his ground while the ball is in play, that wicket which he has left may be put down, and the striker given out, although the other batsman may have made good the ground at that end, and the striker and his substitute at the other end.

40. A batsman is liable to be out for any infringement of the laws by his substitute.

41. The fieldsman may stop the ball with any part of his person, but if he willfully stop it otherwise, the ball shall be "dead" and five runs added to the score; whatever runs may have been made five only shall be added.

42. The wicket keeper shall stand behind the wicket. If he shall take the ball for the purpose of stumping before it has passed the wicket, or if he shall incommode the striker by any noise or motion, or if any part of his person be over or before the wicket, the striker shall not be out, excepting under Rules 26, 27, 28, 29, and 30.

43. The umpires are the sole judges of fair or unfair play, of the fitness of the ground, the weather, and the light for play; all disputes shall be determined by them, and if they disagree the actual state of things shall continue.

44. They shall pitch fair wickets, arrange boundaries where

necessary, and the allowances to be made for them, and change ends after each side has had one innings.

45. They shall allow two minutes for each striker to come in, and ten minutes between each innings. When they shall call play, the side refusing to play shall lose the match.

46. They shall not order a batsman out, unless appealed to by the other side.

47. The umpire at the bowler's wicket shall be appealed to before the other umpire in all cases, except in those of stumping hit wicket, run out at the striker's wicket, or arising out of Rule 42, but in any case in which an umpire is unable to give a decision, he shall appeal to the other umpire whose decision shall be final.

48a. If the umpire at the bowler's end be not satisfied of the absolute fairness of the delivery of any ball he shall call "no ball."

48b. The umpire shall take especial care to call "no ball" instantly upon delivery: "Wide ball" as soon as it shall have passed the striker.

49. If either batsman run a short run, the umpire shall call "one short," and the run shall not be scored.

50. After the umpire has called "over," the ball is "dead," but an appeal may be made as to whether either batsman is out; such appeal, however, shall not be made after the delivery of the next ball, nor after any cessation of play.

51. No umpire shall be allowed to bet.

52. No umpire shall be changed during a match, unless with the consent of both sides, except in case of violation of Rule 51; then either side may dismiss him.

53. The side which goes in second shall follow their innings if they have scored eighty runs less than the opposite side.

54. That on the last day of a match, or if a one-day match at any time, the in-side shall be empowered to declare the innings at an end.

HISTORY OF CRICKET

Cricket was probably at first a mere game of bat and ball, without the wicket, and French authors say it was derived from the French *Crosse*, which is also called *Criquet*. The name is probably from the Saxon *Cric*, a crooked stick, referring to the early bats, which were curved, instead of straight as now. In the wardrobe account of King Edward I., for the year 1300, is an item in which is mentioned playing at *Creag*, supposed to have been an early form of cricket. At first the only players seem to have been batsman and bowler; fielders appear for the first time in a picture of 1344. In the fifteenth century the game was called "Hondyn and Hondoute" (hand in and hand out), showing that there was then an in and an out side. Under this title it was among the games forbidden by Edward IV., in 1477, as interfering with the practice of archery. The first appearance of the present name is in 1593, in a lawsuit about a piece of ground, in which a man testified that he had played "at crickett" there fifty years before. Early in the eighteenth century the game became popular, being played by all classes of people, and in 1751 Frederick, Prince of Wales, died from a hit with a cricket ball while playing at Cliefden House. It was a favorite especially in the southern counties of England, and matches between players in the different counties began to be held, which have continued to the present day. There are now cricket clubs in every village in England, and it is known as the national game of that country.

In the early history of cricket, as has been said, the wicket did not exist. A circular hole was used instead, into which the ball was bowled. The first wicket consisted of one stump only eighteen inches high, then a second was placed two feet from it, and they were connected by a crossbar. The hole was still retained between the stumps. About 1775 the third stump was added, and the wicket was gradually made smaller, till in 1817 it reached its present size. The bats were made first with a sweeping curve, the present straight bats coming into use about 1825. The bowling was always underhand till 1785, when round arm or straight arm bowling was introduced. It was declared unfair, but since 1825 has been adopted, and in 1864 all restrictions as to the height of the arm in bowling were removed, causing a revolution in the game, by giving much greater power to the bowler.

In the United States it has been played since the middle of the eighteenth century, but it has never been popular.

How a Match is Played

We give this sketch from the pen of an eminent English cricketer.

When both sides have mustered on the ground, each will be under the charge of a captain, who will manage the side, arrange the order in which his batsmen are to go in, and the place each man is to occupy in the field. The captains must also arrange at what time lunch is to be taken, and at what time "stumps are drawn," i.e., at what time play stops for the day. If the match inclosure is restricted by the presence of a ring of spectators or is limited in size, hits to the ring or to the boundary might not get their full value, and hence a nominal value is assigned to them by arrangement between the umpires (Rule 44), this value being accredited to the batsman if he hits the ball to the boundary, or to the score if the ball travels there in the way of "byes" or "leg byes," under Rule 17. It is the business of the umpire at the bowler's end to decide whether the ball has actually reached the boundary. The usual allowance for such strokes is four runs, but if the ball is hit clean out of the ground, six runs are generally awarded. Three runs should never be recognized for a boundary hit, for the following reason: it may happen that toward the close of a game, when time is precious, a good batsman may be partnered by a bad one; the bowler will naturally be anxious to bowl to the inferior player, and if he finds the superior player opposed to him, he can deliberately sacrifice three runs by sending a ball to the boundary, and as after hit or bye for an *odd* number of runs the batsmen "change ends"—this will be explained hereafter—the inferior player will have to receive the next ball bowled. This is also the reason why the batsmen do not change ends after a "wide" or "no ball" has been delivered.

The boundaries and the times for stopping having been arranged, the captains then—but *not* before—toss for the choice of innings, the successful captain having the privilege of taking the first innings for his side, or of ordering the others to bat first. As a rule, it is wise to go in first. The other side —the "fielding" side—then goes out to the ground; its captain appoints two men to bowl alternately from either end, and directs the others to take their proper places in the field, the umpires having preceded them to the ground. When all is ready, the two selected batsmen go to the wickets, having settled between themselves which is to receive the first ball.

Here a digression is necessary to explain the positions of the fieldsmen: their individual duties are explained elsewhere, but it may be premised for the information of those who are not acquainted with the game, but who wish to become initiated into its mysteries, that the bowler is armed with the ball, and that his business is to try to get the batsman out in one of the various ways for which provision is made by the rules (Rules 21–30); that the fieldsmen endeavor to give him their best support, and that the batsmen, each in his turn, try with the aid of the bat to baffle their assaults.

It is impossible to lay down any final statement as to the positions taken up by the different fieldsmen, many circumstances combining to influence the judgment of the captain and bowler—who should always work in concert on this point —as to the best arrangement of their forces; the most important of these circumstances are the pace of the bowling; the condition of the ground, whether fast or slow; the ability of the fieldsmen, and the character, known or to be discovered, of the striker, who may be a consistent hard-hitter, an occasional hard hitter—perhaps in a particular direction only—or a quiet and steady batsman. Nothing except experience can guide the authorities on this point, but it is the duty of captain and bowler to watch the style of every new batsman as he comes in, to see whether any special alterations should be made in the field (i.e., in the fielding side).with a view to getting him out. With this preface a couple of diagrams are here submitted, giving the usual positions of the fieldsmen, first for a fast bowler, and secondly for a slow bowler, it being assumed in each case that the batsman plays a free and sound game, hitting bad balls severely and playing the good ones with a fair amount of freedom. It may also be premised that to hit a ball from eighty to ninety yards before it reaches the ground is a good free stroke, but not at all beyond the power of an average hitter. In Figure 1, then, the ground is supposed to be fast and in good order; the bowling is fast, too, but not abnormally so; the batsman is supposed to be a free, clean hitter, but not of a phenomenal type; the fieldsmen are all supposed to be first class. The side of the ground on the left of the bowler is known as the "*off*-side"; that on his right as the "*on*-side," or "leg side." One umpire will be observed standing near the wicket at the bowler's end, the other in a line with the "pop-

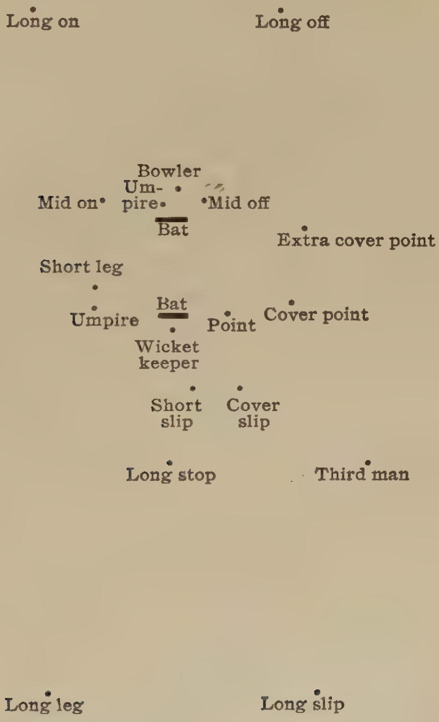


Fig. 1.—The Field as Set for Fast Bowling.

ping crease," and about eighteen yards from it at the other end. The batsman A is about to receive the ball, while his partner B stands behind the popping crease at the other end. The distances of the fieldsmen from the wicket may be roughly reckoned as follows: "Long off" stands at eighty yards; "mid-off," "cover-point," and "third man" at thirty yards; "point," "short-slip," and "cover-slip" at ten yards; the "wicket keeper" is close to the wickets; "mid-on" is in a line with the bowler's wicket, and about ten yards from it. It will be seen that only ten men have places assigned to them, the reason being that the position of the eleventh man depends entirely on the stroke most favored by the batsman A; any of the positions marked long-on, extra cover long-slip, short-leg, or longstop, might well be occupied. Further, if the bowling is very fast or erratic, or the "wicket keeper" is not very good, the latter may with advantage stand back about ten yards. For slow and medium-paced bowling, a man at long-on and extra cover is almost necessary, and cover-slip may be moved to one of these places with advantage, but beyond this it is hard to lay down laws as to the best location of the fieldsmen, for the character of the batting is the only thing that can guide the captain.

After this long, but most necessary digression, we pick up the thread of our story from the point at which the fieldsmen and umpires were imagined to be ready in their places, and the batsmen, having settled which was to receive the first ball, had proceeded to their respective wickets. Batsman A, on going to his wicket, begins by asking the umpire at the other end to give him "guard," or "block"; or in other words, he holds up his bat in front of his wicket, the face toward the umpire, to ascertain whether his bat, as he holds it, is protecting his wicket from the bowler's attack. As the bowler may be either right-handed or left-handed, and may elect to bowl from either side of the wicket, this "guard" is somewhat important, for the batsman may be "out" (under Rule 24) if he obstruct with his leg the passage of the ball to the wicket, and the position of his bat, relative to the position of the bowler, will help him to stand so as to keep his legs clear. The three stumps are known as

CRICKET.

the "leg," "middle," and "off" stumps; the one nearest to the batsman being the "leg-stump." The umpire, placing himself as nearly as possible where the bowler's arm will probably come, or in such a place as the fancy of the batsman may suggest, looks at the bat, held upright about a foot behind the popping crease, and informs the batsman what stump or stumps are hidden from view by the bat; the batsman, when he has found the desired place, either makes a scratch with a bail or his spikes, or hammers a small hole in the ground with the point of the bat, and the ceremony is complete. The batsman now knows what position he occupies relative to the bowler's arm; the umpire looks to see if every one is ready, calls "Play!" and the game begins in earnest. If the batsman hits the ball past one of the fieldsmen, and he and his partner run across from wicket to wicket, each getting inside the popping crease

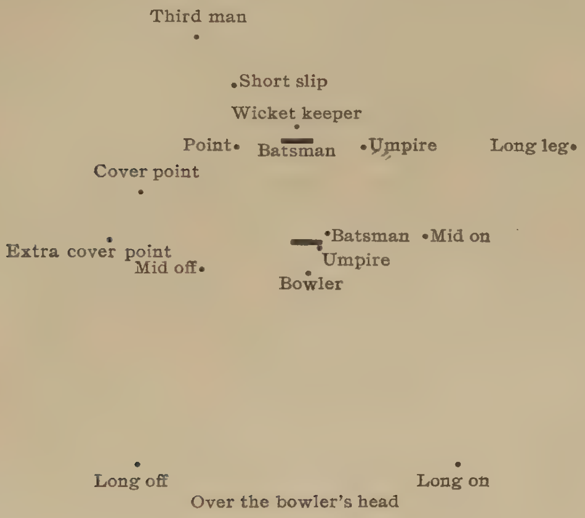


Fig. 2.—The Field as Set for Slow Bowling.
(*Scale, ½ in. to 22 yds.*)

without being "run out" (Rule 28), one run is scored; if the process can be repeated, two runs, and so on. It may be observed that if an *odd* number of runs is made for a hit, batsman B will have to receive the next ball. When five balls have been delivered, the umpire calls "over!" A fresh bowler is deputed to bowl—this time from the other end—and the fieldsmen take up fresh places, but bearing the same relation to the position of the striker as before; but, as we will suppose that the second bowler is a *slow* bowler, the position of the fieldsmen must be to some extent altered, somewhat as shown in Figure 2. Here it will be seen that both third man and short-slip have come several yards closer to the wicket; that point, cover-point, mid-on, and mid-off are at about the old distance from it; and that long-on is now permanent, both he and long-off being at ninety yards distance, more or less, according to the hitting powers of the batsman, on which also depends the position of the eleventh man, who may be placed at extra cover, long-leg, or over the bowler's head; if the last, long-on and long-off would probably move a few yards to their right and left. To save needless walking and waste of time, some of the fieldsmen would occupy a fresh place when "over" was called, but the wicket keeper, point, mid-off, mid-on, and cover-point would cross over. Third man might fall back to long-on, and cover-slip to long-off. The original long-off would come up to third man, and the bowlers would probably field short-slip when not engaged in bowling; but it must be repeated that all these alterations depend on the capacity of the fieldsmen to fill each particular place, and of this the captain must be sole judge. If a left-handed batsman comes in, the field must be reorganized for his benefit, the relative positions of the men being the same; to save time, each man should be given a place as near as possible to that which he occupied for a right-hand batsman.

The history of a whole game is the history of two overs, so far as the routine of the game is concerned. The batsmen maintain their position as long as they can; the fieldsmen move across each time that "over" is called, and the original bowlers, if unable to defeat the batsmen, are replaced by others, according as the captain thinks such a change advisable. The runs mount up, and the "wickets fall"—the cricket phrase for "batsmen are got out"—till there are no more left to come in, or the captain of the batting side "closes his innings" (Rule 54). It should be observed that when ten batsmen have been got out, the whole side is considered out, as although there is one batsman left who has not been defeated, still he must retire, as he has no comrade to remain with him. He is entered in the scoring sheet as "not out." The innings being ended, the original batting side goes out to field, and their opponents proceed to bat, this going on alternately till the day or days assigned to the match come to an end, or the match is decided. No side, however, goes to the wickets more than twice in the same match.

SPORTS AND GAMES

Croquet

By C. S. COLMAN

THERE are not many phenomena in the history of games more curious than the fluctuations in the popularity of croquet under its various forms. That it was ancient we know from a well-known cut in Strut of a "curious ancient pastime, from which, I make no doubt, originated the game of billiards." A glance will show that it contains all the essentials of croquet. Its immediate ancestor, Pall-Mall, the favorite sport of Charles II. and his courtiers, seemed as firmly grounded in public favor as any game could be, but yet it is mainly due to the accidental discovery in a ruined house of the malls and balls which were then used, that we are so much as able to establish the genealogy. It is true that the change is not small from the long straight course of hard-beaten earth, "dressed with powdered cockle-shells," and the "two high arches of iron," to the six or ten hoops upon a closely cut lawn, but the fact of this development is not so curious as the darkness which hangs over the process. From Whitehall and the Court the pastime seems speedily to have departed, but it was kept up in Brittany, and was also a village game in the South of France. From neither of these, however, did it come back to England, but from Ireland, where it had been played, as was maintained, for an unknown length of time. Its popularity in England was immense, and between 1860 and 1870 it spread, not merely over the island, but over India and the Colonies. The general enthusiasm inspired Capt. Mayne Reid to declare that the game had become "the national pastime," and was "to be cherished as the tree of life"!

The reaction was speedy and complete. After 1875 the game fell away in importance; it became a laughing stock, and the butt of much clumsy jesting. One may fear, indeed, that, two or three years ago, some would have been irreverent enough to turn for an account of it to the article on "Obsolete Sports," but at present there is a distinct revival of interest in it. Many can now be found who confess, with some unnecessary protestations and apologies, that they not only play, but enjoy the game.

PREPARATION OF LAWN

The first thing needful is a stretch of level turf, where possible, of about thirty by forty yards in extent. Above all, one should guard against choosing a spot which, though fairly smooth, has a steady slope in one direction. Rough places may be made smooth by diligent work with the roller, but for such a general tendency there is no remedy. The roller should be *light*; a heavy roller tends to exaggerate the worst places, especially if used, as it is sure to be, when the ground is soft. A light roller, used constantly, and a well-oiled mowing machine are the only requisites. The grass must have help against invaders. Dandelions and daisies must all be pulled up, and the hoary plantain faced with especial energy. The roots of the last should be dug out with a penknife, and the bare space where its leaves have killed all vegetation, resown with grass seed in the autumn. There need be no fear of playing on the lawn when soft; a little breaking of the surface seems to strengthen the plant, and the roller soon restores the level, but all "divots" must be replaced at once.

The necessary apparatus is simple, consisting of two one-inch posts twenty-four inches high, hoops of iron (varying in number from six to ten according to the setting adopted), and a mallet and ball for each player. The modern mallet usually consists of an ash shaft some thirty-three inches long, fitted into a cylindrical head, whose length is eight or nine inches, and diameter three inches. The head should be of boxwood. Much ingenuity has been expended in contriving mallets of all varieties, which could never miss their aim. Some had looking glasses fixed on them, which, if focused upon the object ball, secured a hit; others were provided with a leather-tipped end, after the fashion of a billiard cue. Ivory was declared to be the very best material for a mallet, and many were actually made of it.

The ball is made either of beech, or, better, of Turkey boxwood, and has a diameter of three and five-eighth inches. The maximum number of players allowed by the rules is eight, and there are accordingly eight mallets and eight balls, each differently marked.

Arrangement of Hoops and Posts

The modern setting of the hoops is that known as the Championship, or Six-Hoop, plan, which has certainly all the elements of difficulty. Another setting that is sometimes adopted for the sake of variety, and presents several advantages, requires ten hoops, two of which are set crosswise in the middle of the ground to form a cage. The plan chosen must depend somewhat on the size of the hoops. The Championship hoops for gentlemen in 1872 allowed only one-eighth inch margin for the ball on either side. Perhaps the best width for ordinary play is five and one-half inches to six inches, which admits of a satisfactory cage.

Shortly put, the object of the player is to drive his ball through each hoop in its proper order, and from the proper side, and to touch the two sticks or posts, in the fewest number of "turns." A turn or break may consist of any number of strokes. After the first stroke, a player may continue, if he has by it run through his proper hoop or hit another ball. In the former case, he may again attempt either of the two feats; in the latter, he is obliged to bring his own ball to that which has been hit, and, after placing them together, to hit his own in such a manner that both are moved. After this he may again attempt to run through his next hoop, or to hit another ball, when the process is repeated. He may not, however, hit the same ball a second time, unless he has in the interval passed through a hoop in its proper order. Should he fail at any shot, the next player takes the turn.

It was, naturally, some time before the rules were satisfactorily settled, and the codes at first suggested were very complicated. Capt. Mayne Reid, for instance, required one hundred and twenty-six rules with much explanation. In 1870, the Conference Code was issued, and that, with the slight modifications of the next two or three years, may be regarded as the standard authority. The most important amendment is that known as the Boundary Line Rule. By this, a player's turn comes to an end at once if he, in hitting the two balls placed together as above, drive either his own or the croqueted ball over the line that limits the croquet lawn. The effect of this is to prevent the player from indulging in smashing hits, which drive an opponent to the farthest end of the lawn, or which send his own ball flying over the boundary, to be replaced on the edge, within a yard or so of his partner. From the point of view of vigorous exercise, the game has perhaps been somewhat damaged, but it has gained much in delicacy and judgment.

The ideal form of the game requires four players, one pair playing against the other, or two players, each having two balls. These were the varieties adopted in the Championship games, when croquet was universal.

HINTS ON PLAY

The golden rule of croquet, as of whist, is "Play to your partner's hand." It is useless to press on, making hoops, only to be obliged to come back and wait about for one's partner, who has been left behind, and subjected to the attacks of a united couple. So long as a pair can keep together, a game is never lost. Second to this is the warning, never to take an easy shot carelessly. The man who never misses a certainty is a far more dangerous opponent than the brilliant but erratic player who brings off perhaps two long shots out of five, and who has often a yearning to leave his partner in the lurch in order to try them. Each must find out the position in aiming that best suits himself, but for a close shot there is no safer attitude (and few more inelegant) than to stand well over the ball, hold the mallet low, and swing it between the legs. Never *hit* with the mallet, nor should the hands grasp it, except in the "chop" stroke, very tightly. Let the arms swing quite freely, and it will be found, as in golf, that the work is done more effectively, and with a tithe of the exertion, if the weight of body and mallet is the main force applied.

There are two strokes to be used when the balls are to be croqueted which require and repay a considerable amount of practice. They are—(1) The rolling, push, or follow-through stroke; and (2) the chop, screw, or stop stroke. In the first, the mallet must keep along its course at the same pace as the balls start, and there must not be the slightest checking at the moment of contact. Both balls will then run for a considerable, and for much the same, distance. In the "chop" stroke, on the other hand, the object is to move one's own ball as little as possible, and to drive the other well away. In this the mallet should, for once, be gripped tightly, and the ball hit as low as possible. The swing should be entirely checked at the moment of contact, if possible, not at the expense of the turf.

Remember always that however and wherever one's own ball is hit, *the direction* in which the other will tend to go is the line of the two centers produced.

It is perhaps necessary to remind the beginner that the next player must not be allowed to lie so close that he can take advantage of one's mistakes, but should be sent off, with due regard to the boundary rule, to the farthest possible distance.

There is no game in which judgment and strategy play a larger part. Before each stroke one must instinctively ask upon which side of the object ball one would wish to be in case of failure, and play strength accordingly. Roughly speaking, it is well to play hard at an opponent, but gently at a partner, a rule that the partner at his next turn often finds to have been forgotten.

All the countless other devices of croquet—the getting a "rush," i.e., hitting a ball with such force as to drive it into a favorable position for "taking two off"; finessing to the boundary when in difficulties, so that a partner may join one easily, and the distance make it not worth an opponent's while—all these and their like can never be learned from books, but from hard work on the lawn. This one principle may, however, be again enforced, "*Play to your partner.*"

RULES OF THE GAME

The following are the rules adopted by the National Croquet Association of America:—

1. *Interfering with Players.* No player or other person shall be perimtted to interfere with the result of a game by any word or act calculated to embarrass the player, nor shall any one except a partner speak to a player while in the act of striking.

2. *Order of Colors.* The order of colors shall be Red, White, Blue, Black.

3. *Mallets.* There shall be no restriction as to kind or size of mallet used—one or two hands may be used in striking.

4. No player shall change his mallet during a game without permission of his opponent, except in case of accident, or to make a "jump shot."

5. Should a ball or mallet break in striking, the player may demand another stroke, with a new ball or mallet.

6. *Clips or Markers.* Every player shall be provided with a clip or indicator of the same color as his ball, painted on one side only, which he must affix to his arch next in order in course of play, before his partner plays, with the painted side toward the front of the arch. Should he fail to do so his clip must remain upon the arch it rested on before he played, and he must make the points again. Should he move his marker beyond or back of the point he is for, his attention must be called to such error before he plays again, otherwise it shall stand. Should a player put a ball through its arch, he must move the corresponding clip to its proper arch before the next ball is played, otherwise the clip remains as before.

7. *Opening of Game.* All games shall be opened by scoring from an imaginary line through the middle wicket and playing toward the turning stake. The balls must be so played that they rest below the first arch from the turning stake, and

if dislodged, must be replaced—all balls being in play from where they rest, the ball nearest the stake playing first.

8. *Balls—How Struck.* The ball must be struck with the face of the mallet, the stroke being delivered whenever touching the ball it moves it. Should a stake or wire intervene, the stroke is not allowed, unless the ball is struck at the same time, and if the ball is moved, without being struck by the face of the mallet, it shall remain where it rests, and should a point (or roquet) be made, it shall not be allowed, except by the decision of the umpire as to the fairness of the shot. All balls moved by a foul shot may be replaced or not at the option of the opponent.

9. When making a direct shot (i.e., roquet) the player must not push or follow the ball with his mallet; but when taking croquet from a ball (two balls being in contact), he may follow his ball with the mallet; but must not strike it twice.

10. If a player strikes his ball before his opponent has finished his play, the stroke shall stand, or be made over, at the option of the opponent.

11. Should a ball rest against or near a wire, and the umpire or other person agreed on should decide that in order to pass through the arch an unfair or push shot must be made, it shall not be allowed if made.

12. *Foul Stroke.* Should a player in making a stroke move with his mallet any other than his object ball, it shall be a foul, and his play ceases, and all balls moved shall be replaced as before the stroke or remain where they rest, at the option of the opponent.

13. If a dead ball, in contact with another ball, moves on account of the inequality of the ground, while playing the other ball away from it, the player does not lose his shot.

14. *Balls—When Not to be Touched.* A ball must not be touched while on the field, except after a roquet, when it is necessary to place it beside the roqueted ball for the purpose of croquet, or to place it when it has been moved by accident—except by permission of the opponent.

15. *Roquet and Croquet.* A ball roquets another when it comes in contact with it by a blow from the player's mallet, or

rebounds from a wicket or a stake; also the border when it comes in contact with it when croquet is taken from another ball.

16. A player after making a roquet shall not stop his ball for the purpose of preventing its hitting another. Should he do so his play ceases, and all balls shall be replaced as before the stroke, or remain, at the option of the opponent.

17. Roquet gives to the player the privilege of croquet only, and play must be made from the roqueted ball.

18. If a player in taking a croquet from a ball fails to move it, such stroke ends his play, and his ball must be returned, or left where it stops, at the option of the opponent.

19. A player, in each turn of play, is at liberty to roquet any ball on the ground once only before making a point.

20. Should a player croquet a ball he has not roqueted, he loses his turn, and all balls moved by such play must be replaced to the satisfaction of the umpire, or adversary. Should the mistake not be discovered before the player has made another stroke, the play shall be valid, and the player continue his play.

21. In taking croquet from a ball, if player's ball strikes another to which he is "dead," such stroke does not end his play.

22. If a player roquets two or more balls at the same stroke, only the first can be roqueted.

23. *Making of Points.* A player makes a point in the game when his ball *makes* an arch or hits a stake in proper play.

24. If a player makes a point, and afterward at the same stroke roquets a ball, he must take the point, and use the ball. If the roqueted ball is beyond the arch, as determined by Rule 45, and playing ball rests through the arch, the arch is held to be first made. [*Note.* While this is not mathematically correct, the rule is so made to avoid disputes and difficult measurements.]

25. If a ball roquets another, and afterward at the same stroke makes a point, it must take the ball and reject the point. (See note to Rule 24.)

26. A player continues to play so long as he makes a point in the game, or roquets another ball to which he is in play.

27. A ball making two or more points at the same stroke, has only the same privilege as if it made but one.

28. Should a ball be driven through its arch, or against its stake by croquet or concussion, it is a point made by that ball, except it be a rover.

29. *Playing on Dead Ball.* If a player play by direct shot on a dead ball, all balls displaced by such shot shall be replaced in their former position, and the player's ball placed against the dead ball on the side from which it came; or all balls shall rest where they lie, at the option of the opponent.

30. If a player, in making a direct shot, strike a ball on which he has already played, i.e., a dead ball, his play ceases. Any point, or part of a point or ball struck, after striking the dead ball, is not allowed. And both balls must be replaced in accordance with the preceding rule. A dead ball displaced by other than direct shot shall not be replaced.

31. If playing ball in passing through its arch strike a dead ball that is beyond the arch, as determined by Rule 45, the ball shall not be considered a dead ball if playing ball rests through its arch, and the point shall be allowed.

32. *Balls Moved or Interfered with by Accident or Design.* A ball accidentally displaced, otherwise than as provided for in Rule 12, must be returned to its position before play can proceed.

33. If a ball is stopped or diverted from its course by an opponent, the player may repeat the shot or not as he chooses. Should he decline to repeat the shot, the ball must remain where it stops, and, if playing ball, must play from there.

34. If a ball is stopped or diverted from its course by a player, or his partner, the opponent may demand a repetition of the shot if he chooses—Should he decline to do so, the ball must remain where it stops, and, if playing ball, must play from there.

35. If a ball, while rolling, is stopped or diverted from its course by any object inside the ground, not pertaining to the game or ground, other than provided for in Rules 33 and 34,

the shot may be repeated or allowed to remain at the option of the player. If not repeated the ball must remain where it stops, and, if playing ball, play from there.

36. *Balls in Contact.* Should a player, on commencing his play, find his ball in contact with another, he may hit his own as he likes, and then has subsequent privileges the same as though the balls were separated an inch or more.

Concerning Boundary. The boundary is a line extending around the field, usually thirty inches from the border and parallel with it.

37. A ball shot over boundary line or border must be returned at right angles from where it stops before play can proceed.

38. A ball is in the field, only when the whole ball is within the boundary line.

39. No play is allowed from beyond the boundary line, except when a ball is placed in contact with another for the purpose of croquet.

40. If a player strikes his ball when over the boundary line, he shall lose his stroke, and the balls shall be replaced or left where they stop, at the option of the opponent.

41. If a player roquet a ball off the field by a direct shot his play ceases, and the roqueted ball is placed on the boundary opposite the point where it lay before being thus hit. But if a ball off the field is hit from a croquet the hit shall not be allowed, the ball shall be properly replaced in the field, and the play shall not cease.

[The three following rules apply to grounds square-cornered and without slope.]

42. The first ball driven over the boundary line into a corner must be placed on the corner at the intersection of the two boundary lines.

43. If a ball, having been struck over the boundary line, is returnable at the corner, another ball being on or entitled to the corner, it shall be placed on that side of the corner on which it went off.

44. If two balls, having been shot over the boundary line, rest directly behind one another at right angles with boundary

line, they shall be placed on the line alongside of each other in the direction from whence they were played off. This can occur only when the centers of the two balls rest directly behind one another at right angles with the boundary line.

45. *Ball—When through an Arch.* A ball is not through an arch when a straight-edge, laid across the two wires on the side from whence the ball come, touches the ball without moving the arch.

46. *Balls—When in Position.* If a ball has been placed under an arch, for the purpose of croquet, it is not in position to run that arch.

47. If a ball be driven under its arch from the wrong direction, and rests there, it is not in position to run that arch in the right direction.

48. If a ball shot through its arch in the right direction, rolls back through or under that arch, the point is not made, but the ball is in position if left there.

49. *Hitting Ball while Making Wicket.* The cage wickets may be made in one, two, or more turns, provided the ball stops within limit of the cage.

50. Any playing ball within, or under, a wicket, becomes dead to advancement through the wicket from that position, if it comes in contact with any other ball by a direct shot.

51. *Rovers.* A rover has the right of roquet and croquet on every other ball once during each turn of play, and is subject to roquet and croquet by any ball in play.

52. Rovers must be continued in the game until partners become rovers, and go out successively, and a rover that has been driven against the stake cannot be removed to make way for the next rover.

53. *Playing Out of Turn, or Wrong Ball.* If a player plays out of his proper turn, whether with his own or any other ball, or in his proper turn plays the wrong ball, and the mistake is discovered before the next player has commenced his play, all benefit from any point or points made is lost, and his turn of play forfeited. All balls moved by the misplay must be returned to their former position by the umpire or adversary.

If the mistake is not discovered until after the next player has made his first stroke, the error must stand.

54. *Points Remade.* If a player makes a point he has already made, his marker not being on that point, and the mistake is discovered before the proper point is made, the play ceases with the shot by which the wicket was remade, and the marker remains where it stood at the beginning of this play. All balls shall be left in the position they had at the time the wicket was remade. If not discovered before the proper point is made, the points so made are good, and play proceeds the same as if no error had been made.

55. *Error in Order of Play.* If any error in order is discovered after a player has struck his ball, he shall be allowed to finish his play provided he is playing in the regular sequence of his partner's ball last played. In case of dispute as to proper sequence of balls, it shall be decided by the umpire; if there is no umpire, by lot. No recourse shall be had to lot unless each party expresses the belief that the other is wrong.

56. At any time any error in order is discovered, the opposite side shall follow with the same ball last played (the proper sequence); but before playing, their opponents shall have privilege to demand a transposition of adversaries' balls.

Example. Black plays by mistake after red—the error is not discovered—blue plays in the proper sequence of his partner red, and seeing that black has just played, is thus led to believe it the innocent ball, and upon concluding his play leaves black by red. Now, if error in order is discovered, the player of red and blue can demand that the position of black and white be transposed.

57. *Changing Surfdce of Ground.* The surface of grounds shall not be changed during a game by either player, unless by consent of the umpire, and if so changed at the time of playing the shot shall be declared lost.

58. *Direction through Wickets.* In making all side or corner arches, the playing ball shall pass through them toward the center.

59. *Penalty.* If a rule is violated, a penalty for which has not been provided, the player shall cease his play.

SPORTS AND GAMES

Football

By J. D. CHAMPLIN and A. E. BOSTWICK

THE game is played by twenty-two persons, eleven on each side, with a large oval ball, usually of inflated rubber with a leather cover, on a field three hundred and thirty feet long and one hundred and sixty feet wide. At each end is a goal made of two posts eighteen and one-half feet apart, with a crossbar ten feet from the ground. The posts project several feet above the crossbar. The end boundaries of the field are called goal lines. The space beyond these lines, on either end and between the extended side lines, is called a goal. The space outside the side lines and between the extended goal lines is called touch, and the space at the corners of the field, between the extended goal and side lines, is called touch-in-goal, as shown in the diagram. Usually the field is marked also with cross lines every five yards, to aid the referee in determining how far the ball has advanced. These lines give the football field the look that has led to its popular name of "the gridiron." Two of them, the fifth from each goal respectively, are called the "twenty-five-yard lines." All the lines are marked with lime. Each party or "team" consists of eleven persons, namely, seven rushers or forwards, a quarter-back, two half-backs, and one full-back or goal tend. The opposing players face each other, and each side tries to carry or kick the ball toward the opposite goal, and either to touch the ball to the ground behind the goal (called "making a touchdown") or to kick it over the crossbar between the goal posts (called "kicking a goal"). In general, the rushers try to carry the ball forward and also to protect the half-backs and full-back, who do all the kicking.

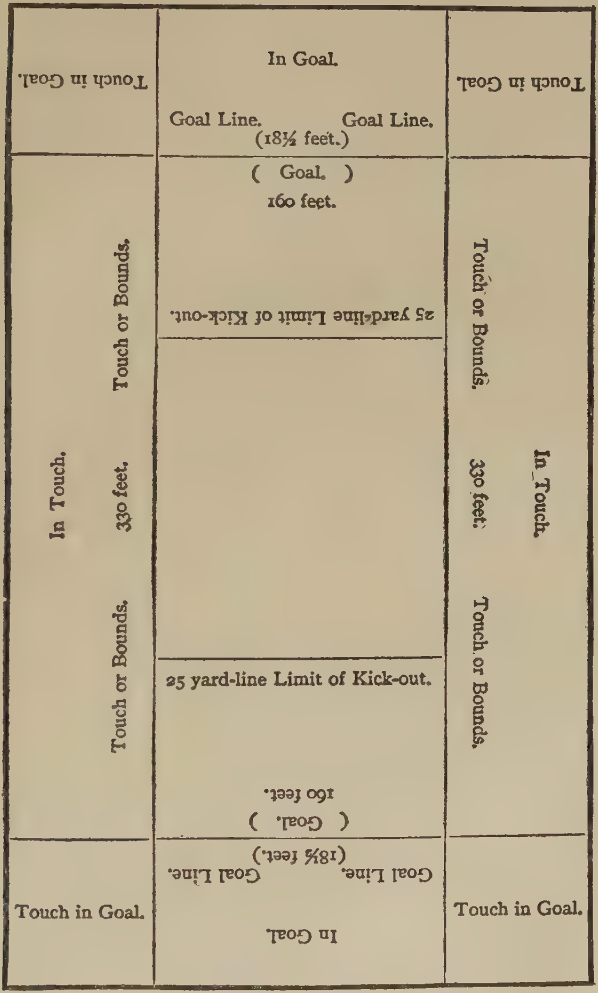


Diagram of Field.

The center rusher or "snapper-back," should be a large, powerful man, but it is not necessary that he should run fast. His neighbors on either side are called "guards," those next to these the "tacklers," and the farthest ones the "end rushers," who must be good general players and fine runners. The quarter-back's position is the most responsible on the field, as it rests with him to determine the direction of the playing, and at critical moments he may even change the captain's policy. When the ball is held by the enemy the quarter-back plays as a rusher or half-back. The best players in this position have usually been rather small men. The half-backs should possess coolness and pluck, and must run, kick, and tackle well. The full-back must be a long kicker and fine tackler, so that it will be almost impossible for a hostile man to pass him. The captains usually direct the play of their men by secret signals previously agreed upon.

The leaders of the sides toss up before the game, and the winner takes either the "kick-off" or the choice of goals.

The players on each side now stand with their backs toward their own goal—the seven rushers in a line, the quarter-back just behind, then the half-backs a few yards away, and finally the full-back a dozen yards or so to the rear. The side having the "kick-off" places the ball in the center of the field, and one of that side kicks it toward the opposite goal. As soon as it is kicked, it is said to be "in play." Before that, all on the kicking-off side stand behind the kicker, and all on the opposite side must stand at least ten yards before the ball. The player who next gets possession of the ball has the choice of kicking it, of running with it, or of throwing it to some other player on his own side; but he must throw it sideways or back, never straight or diagonally forward. If he run with it, the opposed players may try to stop him by seizing or "tackling" him anywhere above the knees. He may try to keep them off by pushing with his open hand, but not with his closed fist. It requires skill as well as strength to stop a good runner. Sometimes four or five men will be unable to hold him, while at others a small player will stop a large one almost instantly. If he be tackled, and the ball fairly held, he must say "down," and a player on his side, usually the snapper-back, then puts the ball on the ground for a "scrimmage." The opposing rushers form in two lines, facing each other, each on their own side of the place where the ball was down. The snapper-back takes the ball and "snaps" it (see note under Rule 6) back to the quarter-back, who passes it to another player on his own side. That player may then try to carry it through the opposing rush line or kick it, but if in three successive "downs" by the same side the ball is not advanced five yards, or taken back twenty yards, it must then be kicked, or surrendered to the opponents on the next failure to advance. When a ball is kicked, any one on the opposite side who catches it fairly, without stepping from his place, at the same time making a mark with his heel on the ground, may have a "free kick." The opponents may then come up to that mark, but must not pass it till, after retiring as far as he wishes, the one who made the catch kicks it. He may take a "drop kick," or a "punt," or hold the ball for a "place kick" (all of which are described fully in Rule 2), but if he takes a place kick the opponents may advance, or "charge," as soon as the ball touches the ground. When in the course of the game a player succeeds in getting the ball near enough to his opponent's goal, he may try to kick a goal, which he may do in any way except by a punt, or he may touch the ball down in goal, which is called making a touchdown. His side must then make a "try at goal," either by a place-kick or a punt-out as described in Rules 24 and 25. When a side has the ball, but is hard pressed, near its own goal, it may gain a temporary advantage by taking the ball back across the goal line and making a safety touchdown, or "safety," as described in Rule 4 (*d*). The ball can then be carried straight out, not more than twenty-five yards from the goal line, and kicked. Till it is so kicked the opposing side must not come nearer the goal line than twenty-five yards. A "safety" counts against the side making it, but if the ball is kicked or carried across the goal line by one of the opposite side and then comes into possession of the owners of the goal, who touch it down, it is called a touchback, and does not count against them. If the ball crosses the side lines, or "goes in touch," it is put in play again, as described in Rule 22.

During the game every player is either "off-side," or "on-side," and only those "on-side" can take active part in the game. Rule 10 tells when a player is off-side and how he is put on-side again. The ball must be either "in play" or "dead," and while it is "dead" no play may be made. For instance, when a safety has been made, the ball is dead till it is put in play, according to rule, by a kick-out. Till it is so put in play, the player holding it may not run with it, kick it, nor throw it, and the opposing players must make no effort to get possession of it. Rule 11 gives all the cases where a ball is dead. All disputed points during a match game are decided by a referee, an umpire, and a linesman, as described in Rule 29. In a practice game one person often does duty for all three.

A game consists of two halves, each thirty-five minutes long, with a ten-minute intermission; and the side scoring the greatest number of points wins. The points are determined by the goals, touchdowns, and safeties as explained in Rule 26. The details of the game will be better understood by studying the rules given here.

The balls used for playing are of various kinds. The Rugby, once used in all football games in this country, is oval, and consists of an India-rubber bladder with a leather case. The English Association ball has also a bladder and case, but is round. These different kinds of ball are made in various sizes, from twenty to thirty-three inches in circumference. Football players now usually wear canvas jackets lacing in front, and trousers of fustian or some other stout material, padded over the knees and thighs. Long woollen stockings are worn, and sometimes the forwards use shin-guards. Shoes are of leather or canvas, with leather-strips or spikes on the sole. The quarter-back, center-rush, and full-back often wear simply knit jerseys.

The following rules for playing football are substantially those adopted in 1898 by the University Athletic Club:—*

EQUIPMENT, OFFICIALS

RULE 1.—(*a*) The game shall be played upon a rectangular field, of dimensions described in the preceding article.

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*In the same year associations of Western and Southern colleges adopted rules of their own which differ slightly from these.

FOOTBALL—READY TO PLAY.

(*b*) The game shall be played by two teams of eleven men each.

(*c*) The officials shall be a referee, an umpire, and a linesman.

(*d*) The football used shall be of leather, enclosing an inflated rubber bladder. The ball shall have the shape of a prolate spheroid.

DEFINITION OF TERMS

RULE 2.—(*a*) A *Drop-kick* is made by letting the ball drop from the hands and kicking it the instant it rises from the ground.

(*b*) A *Place-kick* is made by kicking the ball after it has been placed on the ground.

(*c*) A *Punt* is made by letting the ball drop from the hands and kicking it before it touches the ground.

(*d*) A *Kick-Off* is a place-kick from the center of the field of play, and cannot score a goal. (Rule 8.)

(*e*) A *Kick-Out* is a drop-kick, place-kick, or punt made by a player of the side which has made a safety or a touchback.

(*f*) A *Free Kick* is a term used to designate any kick when the opponents are restrained by rule from advancing beyond a certain point.

RULE 3.—(*a*) The ball is *Out of Bounds* when it or any part of the player who holds the ball touches the ground on or outside the side line or side line extended.

(*b*) If the ball is kicked so that it goes out of bounds before crossing the opponents' goal line, it shall belong to the opponents. If, however, it strikes any player who is on-side, and then goes out of bounds, it shall belong to the player who first obtains possession of it.

RULE 4.—(*a*) A *Touchdown* is made when the ball in possession of a player is declared dead by the referee, any part of it being on, over, or behind the opponents' goal line.

(*b*) The point where the touchdown is marked, however, is not where the ball is carried across the line, but where the ball is fairly held or called "down."

(*c*) A *Touchback* is made when the ball in possession of a player guarding his own goal is declared dead by the referee, any part of it being on, over, or behind the goal line, provided the impetus which sent it to or across the line was given by an opponent.

(*d*) A *Safety* is made when the ball in the possession of a player guarding his own goal is declared dead by the referee, any part of it being on, over, or behind the goal line, provided the impetus which caused it to pass from outside the goal to or behind the goal line was given by the defending side.

RULE 5.—A *Punt-Out* is a punt made by a player of the side which has made a touchdown to another of his own side for a fair catch.

RULE 6.—(*a*) A *Scrimmage* takes place when the holder of the ball places it upon the ground and puts it in play by kicking it forward or snapping * it back.

(*b*) If, after the snapper-back has taken his position, he should voluntarily move the ball as if to snap it, the scrimmage has begun.

(*c*) When snapping the ball back, the player so doing must be on-side, the hand or foot used in snapping the ball excepted. (Rule 10.)

RULE 7.—(*a*) A *Fair Catch* consists in catching the ball after it has been kicked by one of the opponents and before it touches the ground, or in similarly catching a punt-out by another of the catcher's own side, provided the player, while making the catch, makes a mark with his heel. It is not a fair catch if the ball, after the kick, was touched by another of his side before the catch. Opponents who are off-side shall not interfere in any way with a player attempting to make a fair catch, nor shall he be thrown to the ground after such catch is made, unless he has advanced beyond his mark.

(*b*) If a side obtains a fair catch, the ball must be put in play by a punt, drop-kick, or place-kick, and the opponents cannot come within ten yards of the line on which the fair catch was made; the ball must be kicked from some point directly behind the spot where the catch was made, on a line parallel to the side line.

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* Snapping the ball means putting it back by hand or foot with one quick and continuous motion from its position on the ground.

RULE 8.—A *Goal* is made by kicking the ball in any way, except by a punt, from the field of play over the crossbar directly over one of the uprights of the opponents' goal.

RULE 9.—*Charging* is rushing forward to seize or block the ball or to tackle a player.

RULE 10.—(*a*) In a scrimmage no part of any player shall be ahead of the ball when it is put in play. (Exception under Rule 6, *c*.)

(*b*) A player is put off-side if the ball in play has last been touched by one of his own side behind him. No player, when off-side, shall touch the ball except on a fumble or a muff, nor shall he interrupt or obstruct an opponent with his hands or arms until again on-side. No player can, however, be called off-side behind his own goal line.

(*c*) A player being off-side is put on-side when the ball has touched an opponent, or when one of his own side has run in front of him, either with the ball, or having been the last player to touch it when behind him.

(*d*) If the ball, when not in possession of either side, is touched when inside the opponents' ten-yard line by a player who is off-side, it shall go as a touchback to the defenders of that goal.

RULE 11.—The ball is *Dead:*—

(*a*) Whenever the referee or umpire blows his whistle or declares a down.

(*b*) When the referee has declared that a down, touchdown, touchback, safety, or goal has been made.

(*c*) When a fair catch has been heeled.

(*d*) When it has been downed after going out of bounds.

RULE 12.—(*a*) The length of the game shall be seventy minutes, divided into two halves of thirty-five minutes each, exclusive of time taken out. There shall be ten minutes' intermission between the two halves.

(*b*) The game shall be decided by the score at the end of the two halves.

(*c*) Time shall not be called for the end of a half until the ball is dead, and in case of a touchdown, the try-at-goal shall be allowed.

(*d*) Time shall be taken out whenever the game is unnecessarily delayed, or while the ball is being brought out for a try-at-goal, kick-out, or kick-off, or when play is for any reason suspended by the referee or umpire. Time shall begin again when the ball is actually put in play.

(*e*) No delay shall continue more than two minutes.

RULE 13.—(*a*) The captains shall "toss up" before the beginning of the game, and the winner of the toss shall have his choice of goal or kick-off. The ball shall be kicked off at the beginning of each half. Whenever a goal, following a touchdown, has been tried, or a goal from the field has been kicked, the side defending that goal shall kick off. The teams shall change goals at the beginning of the second half. The same side shall not kick off at the beginning of two successive halves.

(*b*) At kick-off, if the ball goes out of bounds before it is touched by an opponent, it shall be brought back and kicked off again. If it is kicked out of bounds a second time, it shall go as a kick-off to the opponents. If either side thus forfeits the ball twice, it shall go to the opponents, who shall put it in play by a scrimmage at the center of the field.

(*c*) At kick-off, if the ball is kicked across the goal line and is there declared dead when in the possession of one of the defending side, it is a touchback. If it is declared dead thus in possession of the attacking side, it is a touchdown.

(*d*) At kick-off and on a kick from a fair catch, the opposite side must stand at least ten yards in front of the ball until it is kicked. On a kick-out, the opposite side cannot stand nearer the goal than the twenty-five-yard line, except on a kick-out made after a drop-kick upon the first down inside the twenty-five-yard line, when the fifteen-yard line is the restraining mark. (See Rule 23, exception.)

RULE 14.—(*a*) The side which has a free kick must be behind the ball when it is kicked.

(*b*) In the case of a kick-off, kick-out, or kick from a fair catch, the ball must be kicked a distance of at least ten yards toward the opponents' goal from the line restraining the player making the kick, unless it is stopped by an opponent; otherwise the ball is not in play.

RULE 15.—(*a*) Charging is lawful, in case of a punt-out or kick-off, as soon as the ball is kicked; and the opponents must not charge until the ball is kicked.

(*b*) In case of any other free kick, charging is lawful: (1) When the player of the side having the free kick advances beyond his restraining line or mark with the ball in his possession; (2) When he has allowed the ball to touch the ground by accident or otherwise.

(*c*) If such lawful charging takes place, and if the side having the free kick fails to kick the ball, then the opponents may line up five yards ahead of the line which restrained them before charging. In that case, the side having the free kick must kick the ball from some point directly behind its mark, if the free kick resulted from a fair catch, and in other cases from behind the new restraining line.

RULE 16.—(*a*) The snapper-back is entitled to full and undisturbed possession of the ball. The opponents must neither interfere with the snapper-back nor touch the ball until it is actually put in play.

(*b*) In snapping the ball back, if the player so doing is offside, the ball must be snapped again, and if this occurs again on the same down the ball goes to the opponents.

(*c*) The man who snaps back and the man opposite him in the scrimmage cannot afterward touch the ball until it has touched some player other than these two.

(*d*) If the man who puts the ball in play in a scrimmage kicks it forward, no player of his side can touch it until it has gone ten yards into the opponents' territory, unless it be touched by an opponent.

(*e*) The man who first receives the ball when it is snapped back shall not carry the ball forward beyond the line of scrimmage, unless he has regained it after it has been passed to and has touched another player.

RULE 17.—(*a*) Before the ball is put in play, no player shall lay his hands upon, or by the use of his hands or arms interfere with, an opponent in such a way as to delay putting the ball in play.

(*b*) After the ball is put in play, the players of the side that has the ball may obstruct the opponents with the body only, except the player running with the ball, who may use his hands and arms.

(*c*) The players of the side not having the ball may use their hands and arms, but only to get their opponents out of the way in order to reach the ball or stop the player carrying it.

RULE 18.—(*a*) Before the ball is put in play in a scrimmage, if any player of the side which has the ball takes more than one step in any direction, he must come to a full stop before the ball is put in play. When the ball is put in play by a scrimmage:—

(*b*) At least five players of the side having the ball must be on the line of scrimmage.

(*c*) If five players, not including the quarter-back, are behind the line of scrimmage and inside of the positions occupied by the players at the ends of said line, then two of these players must be at least five yards back of this line, but all of these players may be nearer than five yards to the line of scrimmage, if two of them are outside the positions occupied by the players at the ends of said line.

RULE 19.—A player may throw, pass, or bat the ball in any direction except toward his opponent's goal.

RULE 20.—(*a*) If a player having the ball is tackled, and the movement of the ball stopped, or if the player cries "down," the referee shall blow his whistle, and the side holding the ball shall put it down for a scrimmage.

(*b*) As soon as a runner attempting to go through is tackled and goes down, being held by an opponent, or whenever a runner having the ball in his possession cries "down," or if he goes out of bounds, the referee shall blow his whistle, and the ball shall be considered down at that spot.

(*c*) There shall be no piling up on the player after the referee has declared the ball dead.

RULE 21.—(*a*) If, in three consecutive downs (unless the ball crosses the goal line), a team has neither advanced the ball five yards nor taken it back twenty yards, it shall go to the opponents on the spot of the fourth down.

(*b*) When a distance penalty is given, the ensuing down shall be counted the first down.

RULE 22.—If the ball goes out of bounds, whether it bounds back or not, a player of the side which secures it must bring it to the spot where the line was crossed, and there either

(*a*) Touch it in with both hands at right angles to the side line and then kick it; or

(*b*) Walk out with it at right angles to the side line, any distance not less than five nor more than fifteen yards, and there put it down for a scrimmage, first declaring how far he intends walking.

RULE 23.—A side which has made a touchback or a safety must kick out, from not more than twenty-five yards outside the kicker's goal. If the ball goes out of bounds before striking a player, it must be kicked out again, and if this occurs twice in succession, it shall be given to the opponents as out of bounds on the twenty-five-yard line on the side where it went out. At kick-out, the opponents must be on the twenty-five-yard line or nearer their own goal, and the kicker's side must be behind the ball when it is kicked. Should a second touchback occur before four downs have been played, the side defending the goal may have the choice of a down at the twenty-five-yard line, or a kick-out.

RULE 24.—(*a*) A side which has made a touchdown must try at goal, either by a place-kick or a punt-out.

(*b*) After the try-at-goal, whether the goal be made or missed, the ball shall go as a kick-off at the center of the field to the defenders.

RULE 25.—(*a*) If the try be by a place-kick, a player of the side which has made the touchdown shall hold the ball for another of his side to kick at some point outside the goal on a line parallel to the side line passing through the point where the touchdown was declared. The opponents must remain behind their goal line until the ball has been placed upon the ground.

(*b*) If the try-at-goal is to be preceded by a punt-out, the punter shall kick the ball from the point at which the line parallel to the side line, and passing through the spot of the touchdown, intersects the goal line. The players of his side must stand in the field of play not less than five yards from the goal line.

(*c*) The opponents may line up anywhere on the goal line except within the space of ten feet on each side of the punter's mark, but they cannot interfere with the punter. If a fair catch be made from a punt-out, the mark shall serve to determine the positions as the mark of any fair catch, and the try-at-goal shall then be made by a place-kick from this spot, or any point directly behind it. If a fair catch be not made on the first attempt, the ball shall go as a kick-off at the center of the field to the defenders.

(*d*) The holder of the ball in any place-kick may be off-side or out of bounds without vitiating the kick.

RULE 26.—The following shall be the values of plays in scoring: Goal obtained by touchdown, six points; goal from field kick, five points; touchdown failing goal, five points; safety by opponents, two points.

RULE 27.—(*a*) No one having projecting nails or iron plates on his shoes, or wearing upon his person any metallic or hard substance that in the judgment of the umpire is liable to injure another player, shall be allowed to play in a match. No sticky or greasy substance shall be used on the persons of the players.

(*b*) A player may be substituted for another at any time at the discretion of the captain of his team, and the player who has been replaced cannot return to the game.

(*c*) There shall be no tripping or tackling below the knees.

PENALTIES

RULE 28.—A foul is any violation of a rule. [The latest rules prescribe minutely the penalties for each kind of foul. In general, when the offending side has the ball, it is punished by being made to surrender it to the other side; if not, the ball is advanced from five to fifteen yards.]

DUTIES OF OFFICIALS

RULE 29.—The referee is responsible for the enforcement of Rules 1, 2, 3, 4, 5, 6 (*a* and *b*); 7 (except as relates to interference, throwing catcher, and positions of players); 8, 11, 12, 13 (except *d*); 14, *b*; 16, *e*; 19, 20 (*a* and *b*); 21, 22, 23 (except as relates to positions of players); 24, 25 (except as relates to positions of players and interference); 26.

In making his decisions, the referee must recognize and allow precedence to any penalty inflicted by the umpire for a foul.

The referee's decisions are final upon all points not specified in the duties of the umpire.

The referee shall see that the ball is properly put in play, and he is judge of its position and progress.

At the beginning of a game and after time has been taken out, he shall ascertain from each captain that his team is ready, before ordering play.

He is sole authority for the score of the game and is judge of forfeiture of the game under the rules.

The referee may appeal to the umpire and linesman for testimony.

The umpire is responsible for the enforcement of all rules whose infringement is punishable by a distance penalty or by the surrender of the ball to the opponents, except 13, *b*; 16, *e*; 19, and 23, viz.: Rules 6, *c*; 9, 10, 13 *d*; 14, *a*; 15, 16 (except *e*); 17, 18, 20, *c*; 27.

The umpire is judge of the conduct of the players, and his decision is final regarding such fouls as are not specifically placed within the jurisdiction of the referee.

The umpire is judge of charging, and of the positions of players whenever the ball is put in play.

He may appeal to both the referee and linesman for testimony in cases of fouls seen by them.

The umpire shall not blow his whistle, nor declare the ball dead, nor call time, except to grant a penalty for a foul committed.

The linesman shall, under the supervision of the referee, mark the distances gained or lost in the progress of the play.

He shall be provided with two assistants, who shall remain outside the field of play, and who shall use, in measuring distance, a rope or chain.

The linesman shall, under the direction of the referee, also keep the time, and shall notify the captains of the time remaining for play, not more than ten nor less than five minutes before the end of each half.

History of the Game

Football was a favorite game in the days of ancient Greece and Rome. The game comes to us from England, where it has been played for centuries. It was customary at one time for the different villages in the Midland counties to play against each other, and desperate struggles often took place, which sometimes grew into riots and produced long and bitter feuds. Football was early played at the great English schools, and at each of them new features were introduced, till several forms of the game were developed. About 1860 football clubs began to be formed near the large cities, and on May 8, 1866, these clubs sent delegates to a convention, and adopted rules excluding features of the school games that were considered too rough. Football, as thus played, did not become popular in this country till about ten years after the adoption of these rules. In 1875 Harvard and Yale played their first game of football with Rugby rules, and soon afterward the game became a favorite at other colleges. The game just mentioned was played with eleven men on a side, and this is the number that the present college rules allow, though in the years 1878 and 1879 it was played with fifteen on a side. The game is played in this country from about the first of October till the end of November. It is very rough, and often results in injury to the players, but the roughness is now restrained, by strict rules, within reasonable limits, and a slight degree of danger adds to the fascination of the game for most persons.

SPORTS AND GAMES

Golf

By J. D. CHAMPLIN and A. E. BOSTWICK

A GAME played by any number of persons, with sticks or clubs like shinny sticks, and small balls about an inch and a half in diameter. The ball, formerly of leather stuffed with feathers, is now usually made of gutta-percha, "nicked," or cut in crossed lines on the surface, to roughen it.

The course, usually circular and properly between three and five miles long, is marked out on a piece of open ground, and at intervals on it are cut holes four inches in diameter and from one hundred to five hundred yards apart. The golf grounds are usually called "links," because the sandy stretches by the seashore, known in Scotland by this name, are there regarded as best adapted to it. The links should contain "hazards"—a general term for obstacles of any sort (see Rule 15). Two players, starting from the first hole, take turns in striking their balls into the next, and he who does so in the fewest strokes scores a point or "a hole," as it is called. They then play for the next hole in like manner, and so on till they have gone around the course (usually eighteen holes). If they make any hole in the same number of strokes, that hole is scored by neither. He who scores the greatest number of holes with the fewest strokes wins. The reckoning of the strokes is made technically thus: If a player's opponent has played one more stroke than he, the player's next stroke is called "the like"; if two more, "the one off two," if three more, "the one off three," etc.

Each player has his own ball, and clubs of various shapes and sizes. He selects the one he needs at any particular time, according to the nature of the ground, and the others are carried by an attendant called a "caddie." Each club has its peculiar name. All have wooden handles, but are called "wood clubs" or "irons," according to the material of the head. A wood club shod or soled with brass is called a "brassie." The following is a complete list of golf clubs: *Wood Clubs*—Drivers, long spoons, mid spoons, short spoons, baffy, brassie niblicks, bulger drivers, bulger brassies, brassies, putters. *Irons*—Cleeks, iron niblicks, putting cleeks, driving cleeks, lofting irons, driving irons, mashies, gun metal putters, medium irons. The driver or play club is generally used if the distance from the hole is too great to be covered in a single stroke; the putter for striking the ball into a hole; the spoon (now generally superseded by the iron clubs) for getting the ball out of a depression in the turf, called a "cup"; the sand iron for driving the ball out of a sand-pit or "bunker." Should the ball lie deep in the sand, or beside a stone, the cleek or the niblick may be used. Some golfers use the iron-headed clubs as "putters." Besides these, there are the driving iron (not so long a driver as the cleek, but able to pitch the ball higher); the lofting iron, for lifting the ball very high; and the mashie, a compromise between lofting iron and niblick, used for short approaches. A set of six clubs is considered enough for an expert, and the beginner can get along with two or three. In striking the ball, the club must be held with both hands as close together as possible, the left being about two inches from the end. The club, grasped firmly with the left and guided with the right, is lifted over the shoulder, and brought down sharply on the ball, letting the lower end just scrape the ground. The club should follow the ball in the stroke. The distance to which the ball can be sent depends more on the manner of hitting than the actual strength used. The exact manner of standing, called the "stance," is a matter about which there is a great difference of opinion among good golf players. The object is to stand so and at such a distance that the ball will be struck squarely behind and exactly in the middle of the club-head. If it strikes too near the end of the head (called the "toe") or too near the bend (called the "heel"), it is said to be "toed" or "heeled," and will swerve to one side or the other. The majority of players place the right foot a little in advance. When thus standing, ready to strike, the player is said to "address" the ball. Before striking the ball it is customary to sway the club gently over it to measure its position. This movement is called the "waggle," and is done with the wrists only.

The last stroke between any two holes, by which the player tries to place the ball in the hole, is called putting (pronounced to rhyme with cutting), and is the most difficult part of the game, the preliminary strokes, called driving, being much more simple. The ground for some distance around each hole is usually covered with smooth turf and called the "putting green" (see Rule 30). In putting, the nature and condition of the ground, the position of the playing ball, and that of his adversary's, must all be taken into consideration, as well as the state of the score, on which it sometimes depends whether the player will risk a difficult "put" or not. The stroke that drives the ball on the putting green is called the "approach shot." In putting, a rapid straight stroke is called a "gobble," and a successful long stroke a "steal." When the opponent's ball lies directly between the player's and his hole it is called a "stimy," and when the player sends his ball over the obstacles he is said to "loft over the stimy." When the player strikes the ground as well as the ball, he is said to "baff," and when his club razes the grass slightly he is said to "scruff." When a hole has been gained the player lifts his ball and places it on a little heap of sand called a "tee," from which he plays it toward the next hole. When a ball is thus placed it is said to be "teed."

The following rules are substantially those of the St. Andrew's Royal and Ancient Golf Club, as modified in 1897 by the United States Golf Association:—

1. The game of golf is played by two or more sides, each playing its own ball. Two sides of single players constitute a match called a "single." Two sides of two players each constitute a "foursome."

2. The game consists in each side playing a ball from a tee into a hole by successive strokes, and the hole is won by the

side holing its ball in the fewest strokes, except as otherwise provided in the rules. If two sides hole out in the same number of strokes, the hole is halved.

"Match play," in which the player has an opponent, is decided by the number of holes won.

"Medal play," in which all the players are called "competitors," is decided by the aggregate number of strokes.

Unless otherwise agreed, a match shall consist of the play of the game over eighteen holes of the links.

3. The teeing ground shall be indicated by two marks placed in a line at right angles to the course, and the players shall not tee in front of, nor on either side of these marks, nor more than two club lengths behind them. A ball played from outside the limits of the teeing ground, as thus defined, may be recalled by the opposite side.

The option of recalling a ball is in all cases forfeited unless exercised at once before another stroke has been played.

The hole shall be four and one-quarter inches in diameter, and at least four inches deep.

4. The ball must be fairly struck at, and not pushed, scraped, nor spooned, under penalty of the loss of the hole.

Any movement of the club intended to strike the ball is a stroke.

5. The game commences by each side playing a ball from the first teeing ground. In a match with two or more on a side, the partners shall strike off alternately from the tees, and shall strike off alternately during the play of the hole.

The players who are to strike against each other shall be named at starting, and shall continue in the same order during the match.

The player who shall play first on each side shall be named by his own side.

6. If a player shall play when his partner should have done so, his side shall lose the hole, except in case of the tee shot, when the stroke shall be recalled at the option of the opponents.

7. The side winning a hole shall lead in starting for the next hole, and may recall the opponent's stroke should he play out of order. This privilege is called the "honor."

8. One round of the links, generally eighteen holes, is a match, unless otherwise agreed upon. The match is won by the side which gets more holes ahead than there remain holes to be played, or by the side winning the last hole when the match was all even at the second last hole.

9. After the balls are struck from the tee, the ball furthest from the hole to which the parties are playing shall be played first, except as otherwise provided for in the rules.

10. Unless with the opponent's consent, a ball struck from the tee shall not be changed, touched, nor moved before the hole is played out, except as otherwise provided for in the rules.

11. In playing through the green, all loose impediments within a club length of a ball, which is not lying in or touching a hazard, may be removed.

Ice, snow, and hail within a club length of the ball through the green may be removed; but on the putting green it may only be removed as provided in Rule 34.

12. Before striking at the ball the player shall not move, bend, nor break anything fixed or growing near the ball, except in the act of placing his feet on the ground and in soling his club.

13. A ball stuck fast in wet ground or sand may be taken out and replaced loosely in the hole which it has made.

14. When a ball lies in or touches a hazard, the club shall not touch the ground, nor shall anything be touched or moved before the player strikes at the ball.

The club shall not be soled, nor the surface of the ground be touched within a radius of a club length from the ball.

When a ball lies on turf in a hazard, or surrounded by a hazard, it shall be considered as being on the fair green; i.e., the club may be soled.

15. A hazard shall be any bunker of whatever nature—water, sand, loose earth, mole-hills, paths, roads of railways, whins, bushes, rushes, rabbit scrapes, fences, ditches, or anything which is not the ordinary green of the course, except sand blown onto the grass by wind or sprinkled on the grass for the preservation of the links, or snow or ice or bare patches on the course.

16. A player, or a player's caddie, shall not press down nor remove any irregularities of surface near the ball, except at the teeing ground, under the penalty of the loss of the hole.

"Near the ball" shall be considered within a club length.

17. If any vessel, wheelbarrow, tool, roller, grass-cutter, box, or other similar obstruction has been placed upon the course, such obstruction may be removed.

18. When a ball is completely covered with fog, bent, whins, etc., only so much shall be set aside as that the player may have a view of his ball before he plays, whether in a line with the hole or otherwise.

19. When the ball is to be dropped, the player shall drop it. He shall front the hole, stand erect behind the hazard, keep the spot from which the ball was lifted, or in the case of running water, the spot at which it entered, in a line between him and the hole, and drop the ball behind him from his head, standing as far behind the hazard as he may please.

The player must drop the ball himself, not his caddie nor his partner. A dropped ball shall not be considered in play until at rest.

20. When the balls in play lie within six inches of each other, the ball nearer the hole shall be lifted until the other is played, and shall then be placed as nearly as possible into its original position.

21. If a ball lie or be lost in water, the player may drop a ball under the penalty of one stroke.

22. Whatever happens by accident to a ball *in motion*, such as its being deflected or stopped by any agency outside of the match, or by the fore-caddie, is a "rub of the green," and the ball shall be played from where it lies. Should a ball lodge in anything moving, such ball, or if it cannot be recovered, another ball, shall be dropped as nearly as possible at the spot where the object was when the ball lodged in it. But if a ball *at rest* be displaced by any agency outside of the match, the player shall drop it, or another ball, as nearly as possible at the spot where it lay. On the putting green the ball may be replaced by hand.

23. If a player's ball strike, or be accidentally moved by

an opponent or an opponent's caddie or clubs, the opponent loses the hole.

If the player's ball strike the other competitor, or his caddie or clubs, it is a "rub of the green," and the ball shall be played from where it lies. If a player's ball at rest be accidentally or intentionally moved by the other competitor or his caddie, the ball must be replaced.

24. If the player's ball strike or be stopped by himself or his partner or either of their caddies or clubs, or if, while in the act of playing, the player shall strike the ball twice, his side loses the hole.

25. If the player, when not making a stroke, or his partner or either of their caddies, touch their side's ball, except at the tee, so as to move it, or by touching anything cause it to move, the penalty is one stroke.

Except at the tee, if the ball move while the player is addressing it, the player loses one stroke.

Except at the tee, if the ball be struck while moving, the penalty is one stroke; i. e., one stroke for the moving and one stroke for the play.

Except at the tee, if struck at while moving and missed, one stroke shall be counted for the moving and another for the miss.

26. A ball is considered to have been moved, if it leaves its original position in the least degree and stops in another.

27. A player's side loses a stroke if he play the opponent's ball, unless: (1) the opponent then play the player's ball, whereby the penalty is canceled, and the hole must be played out with the balls thus exchanged; or (2) the mistake occur through wrong information given by the opponent, in which case the mistake, if discovered before the opponent has played, must be rectified by placing a ball as nearly as possible where the opponent's ball lay.

28. If a ball be lost, and be not found within five minutes, the player's side loses the hole.

Where both balls are lost at the same time, neither side wins the hole, which should be called halved, irrespective of the number of strokes that either side may have played.

29. A ball must be played wherever it lies, or the hole given up, except as otherwise provided for in the rules.

30. The term "putting green" shall mean the ground within twenty yards of the hole, excepting hazards.

31. All loose impediments may be removed from the putting green, except the opponent's ball, when at a greater distance from the player's than six inches.

32. In a match of three or more sides, a ball in any degree lying between the player and the hole must be lifted, or, if on the putting green, holed out.

33. When the ball is on the putting green, no mark shall be placed nor line drawn as a guide.

The player may have his own or his partner's caddie to stand at the hole, but none of the players, nor their caddies, may move so as to shield the ball from or expose it to the wind.

34. The player, or his caddie, may remove (but not press down) sand, worm casts, or snow lying around the hole or on the line of his put. This shall be done by brushing lightly with the hand only across the put and not along it. Dung may be removed to a side by an iron club, but the club must not be laid down with more than its own weight.

35. Either side is entitled to have the flag stick removed, when approaching the hole. If a ball rest against the flag stick when in the hole, the player shall be entitled to remove the stick, and if the ball fall in, it shall be considered as holed out in the previous stroke.

36. A player shall not play until the opponent's ball shall have ceased to roll, under the penalty of one stroke. Should the player's ball knock in the opponent's ball, the latter shall be counted as holed out in the previous stroke. If, in playing, the player's ball displace the opponent's ball, the opponent shall have the option of replacing it.

A player having holed out his ball in the like or the odd, may knock away the opponent's ball from the lip of the hole, and claim the hole, if he had holed in the like, or a half if he had holed in the odd.

37. A player shall not ask for advice, nor be knowingly

advised about the game by word, look, or gesture from any one except his own caddie or his partner or partner's caddie, under the penalty of the loss of the hole.

38. If a ball split into separate pieces, another ball may be put down where the largest portion lies; or if two pieces are apparently of equal size, it may be put where either piece lies, at the option of the player. If a ball crack, or become unplayable, the player may change it on intimating his intention to his opponent.

39. A penalty stroke (a stroke added to the score of a side for infringing rules) shall not be counted the stroke of a player, and shall not affect the rotation of the play.

History of Golf

Golf is a Scotch game, and is derived from the same sources as shinny and polo. It is a great favorite in Scotland, and has been called the national game of that country. It became popular in England and her colonies long ago, but it was almost unknown in this country, except among natives of Scotland, till about 1880, after which it gained rapidly in favor, and about 1895 became a very fashionable sport. The United States Golf Association now includes nearly one hundred clubs.

As early as 1457 golf was forbidden by law, lest it should interfere with archery, but in 1744 the city of Edinburgh voted a silver club to be played for every year. Charles I. of England was fond of the game, and James II. was expert at it. The word golf is derived from the Dutch *Kolf*, a club. It is pronounced *goff* and sometimes spelled that way.

SPORTS AND GAMES

How to Become a Good Golfer

By HARRY VARDON*

A FIRST-CLASS golfer is born, not made, and unless a man possesses certain necessary physical qualifications, no amount of teaching will make him into what he was never intended by nature to be.

Given, however, a man with a fair amount of strength, a good eye, limber muscles, and an even temper, if he will follow certain rules, which I will suggest to him as having proved very useful to me personally, I see no reason why he should not become a first-class golfer.

In the first place, supposing that he has no previous knowledge of the game, let him go to some good professional and learn from him how to swing a driver—he ought not to be allowed to hit a ball before he has taken at least three lessons in swinging. When he has learned to swing properly, then let him practice driving with a ball. After learning to drive, let him then learn how to use a brassey, then his cleek, and so on through the whole bag of clubs. When he feels that he has some knowledge of the various clubs let him go out and practice over two or three holes back and forth, and not until he has learned how and when to use all the different clubs would I allow him to play around the course.

In regard to style, play in whatever style is best adapted to your own physique. The faults of a bad swing can be seen and corrected just as well when occurring in one style of swing as in another, and unless you feel free and easy and comfortable, you will never swing properly.

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*Former champion of Great Britain.

There is one point, however, about which I feel very strongly, and that is, I would urge every one to play off the right foot, and not off the left. I don't think there is any doubt but that you can play straighter and follow through further and better, and consequently get a longer ball off the right foot than is possible off the left.

When you are playing, always try to take a little ground with your club; by "taking a little ground" I don't mean dig your club into the turf, but just graze the ground, and you will get a much longer and straighter ball than if you took it perfectly "clean." When driving take the tee with the ball.

When playing any kind of a shot, whether a long brassey through the green, or a mashie pitch, always try and fix upon some spot where you think the ball ought to drop and endeavor to strike as near that spot as you possibly can.

Never pitch a ball on an approach shot, if running it up will do just as well. It is very much easier to gauge the force necessary to run a ball a given distance than it is to calculate the necessary force to give it to pitch around a certain spot and to gauge the amount of run required to land it near the hole after the ball has stricken the ground.

Putting is a most important matter in any match, for it is very easy to lose a stroke or two on the putting green, and a missed put counts as much as a topped drive. A good plan is to select some spot which catches your eye in a direct line between your ball and the hole, and endeavor to run your ball over that spot. If your line of direction has been accurate and the ball is hit by the blade of the putter exactly at right angles to the line of direction, you ought to hole your put.

Never try to put cut or twist on your ball with your club, unless there is some very necessary reason for it, such as a stymie by a tree or something of that sort. It is an absolute impossibility in my opinion to get as good direction with a cut on the ball as is obtained by playing the ball straight.

Tee your ball high or low, according to whether you intend to carry some bunker at a long distance, or whether you intend to get a low ball with lots of run in it.

I don't believe in training for a match. I think a man's normal condition, always supposing that he is in good health, is the state in which he is most apt to do himself the greatest justice, as his nerves are not then upset by any sudden change from his usual manner of living, and he is less liable to be affected by the various accidents which are always occurring during a match.

Do not get discouraged just because you happen to start out poorly. Most matches are not less than eighteen holes, and there is plenty of time to recover from one or two bad holes; always remember you are not playing against Colonel Bogey, and the other fellows are just as liable as you to be doing as badly as you are before the match is over.

Keep in constant practice, play as often as you can; and don't be always changing the style of your clubs. When you have discovered by actual playing what models suit you, stick to them until you know them thoroughly, and don't imagine just because you have seen some man make a wonderful shot with some particular club that, because you go and buy one like it, you can necessarily do equally well. The more you play with the same clubs, the better you will use them.

Never underestimate your opponent at match play; always play your very best, for you can never tell when he is liable to make a sudden spurt.

Be temperate. You cannot play golf well and drink hard; sooner or later it will affect your eyes, and your power of judging distance and hitting your ball accurately will be lost.

Finally, I want to again impress on any one who wishes to become a good golfer the lasting importance of having the arms and feet work together. Unless they do, you can never become a long straight driver. Remember that after addressing the ball with the club head, as the arms go up in the upward swing you pivot on your left foot, your arms and your left foot in perfect time, one with the other, until at the top of the swing you are on the point of your left toe. As the club comes down, the left foot pivots back to its original position when you addressed the ball, and at the moment when the club head strikes the ball the left heel touches the ground. As the club begins to rise for the follow through, you commence to pivot on your right foot, foot and arms moving together in perfect time, until, at the end of the follow through, you are on the toes of the right foot, and the stroke is finished.

SPORTS AND GAMES

The Game of Hockey

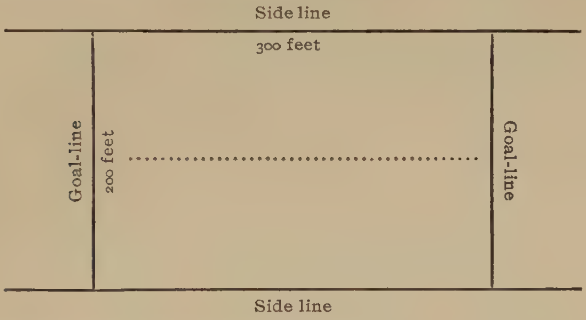
By J. D. CHAMPLIN and A. E. BOSTWICK

HOCKEY, or shinney, is a game played by any number of persons, each of whom has a stick with a curved end, called a hockey, or shinney, with which he tries to drive a small ball past a line called the goal line. The field has two goal lines about three hundred or four hundred feet apart, and is bounded on the sides by lines about two hundred feet apart, as shown in the diagram. An umpire having been selected, the players choose sides, each side electing a captain. They decide in any way they please, usually by lot, which shall have the knockoff, and which the choice of goals, the winner taking whichever of these privileges he likes. The players then stand each with his back to his own goal, and at a distance from it not greater than one third the length of the field. The captain of the side which has the knockoff, or some one chosen by him, then places the ball on the ground as far forward as he chooses, within the above stated limits, but equally distant from both side lines, and strikes it with his hockey. As soon as it moves, any player is free to go to what part of the field he chooses, his object being to prevent the ball's passing over his own goal line, and to drive it across the enemy's line. The side which does this first wins the game.

The sticks used in playing hockey may be of different sizes at the pleasure of the player, but the curved end is generally not more than four inches long. They are sometimes bent from straight sticks, but oftener cut from saplings, part of the root forming the curve. When the game is played on the ice, as it often is, a lighter stick should be used, as less force is required to drive the ball. The ball is commonly of rubber, about two inches in diameter, but a small block of wood called a nun, of about the same size, is often used instead. The ball is better, for it is not so dangerous. Hockey is not played by regular clubs, like football or baseball, and the rules differ somewhat in different places. Those usually followed are given here.

1. Each captain shall place his players as he pleases, sending some forward to try to drive the ball across the enemy's goal line (called "running in"), and some backward to defend his own line (called "lying back").

2. Each player must strike the ball from right to left. If he do so in any other way, he may be told by his opponent to "shinney on his own side," and at the third offence he shall be disqualified by the umpire and must leave the field. (In many places, when no umpire is chosen, custom allows a player to strike an offender against this rule on his shins, but this should not be permitted.)



3. No player shall strike another's hockey except in so far as he must do so in trying to drive the ball. (In many places, when two players meet, each tries to knock the other's stick from his hands before touching the ball, but this should not be permitted, as it places skill below mere strength.)

4. With the exception of the cases stated in the two following rules, no one shall touch the ball with his hand.

5. When the ball is driven over one of the side lines, the

player who reaches it first shall take it in his hand, and going to the point where it crossed the line, throw it on the ground near any player he pleases, either back toward his own goal, or directly across the field, but not toward the enemy's goal.

6. When the ball falls into a hole, or is in any place out of which it cannot be driven with hockeys, it shall be withdrawn with the hand, by order of the umpire, and thrown by him between any players of opposite sides, chosen by the captains.

7. Questions not touched by these rules shall be decided by the umpire.

Some authorities think that the game of polo, or hockey on horseback, was the original form of hockey. The modern form of hockey was played long ago in England, where it was also called hookey and hawkey. Some say that the name is from hock-day, a holiday that celebrated the expulsion of the Danes from England, and others that it is from the hooked sticks with which the game is played.

SPORTS AND GAMES

Hurdle Racing

By C. L. LOCKTON

THIS sport has been in vogue since the early days of amateur athletics, and perhaps in no branch of athletic sports is proficiency more difficult to attain.

Hurdle races at various distances, such as three hundred yards and four hundred and forty yards, are at times included in the competitions at athletic meetings; but from the first, the favorite distance has been one hundred and twenty yards, with ten flights of hurdles, three feet six inches high, placed ten yards apart, thus leaving fifteen yards from the starting-line to the first hurdle, and the same distance between the tenth and the winning-post. Sprint hurdle races must always be run on a straight course. In England they are invariably run on grass, which must be perfectly level; but in America, it is customary to use the cinder track, which is undoubtedly faster. Hence, the American records are slightly better.

The modern hurdle consists of an obstacle specially made, with perfectly level top bars; the result is that flights of uniform regulation height are secured, and no competitor is benefited or impeded by any irregularities in the top bar, as was so often the case in the old style of hurdle. They are fixed on short pedestals of about a foot in length, and are much superior to the old hurdles, in that they can be easily moved and the necessity of driving into the ground is obviated.

It was early discovered that in the race of one hundred and twenty yards with ten flights, each ten yards apart, three was the requisite number of strides on the flat between the hurdles; and no one can hope to attain even mediocrity as a hurdle racer, unless he can accomplish what is generally known as the "three-stride" method. This consists in taking three complete strides on the flat, the fourth stride carrying the runner over the hurdle. To accomplish this the runner must be careful to approach the first hurdle at the highest speed attainable, and in rising from the left foot (jumpers usually preferring to spring from the left) the right knee is raised upward and forward above the hurdle, and the leg (from knee to foot), brought inwards across the line of the body with the foot on as nearly as possible the same level as the knee, traverses the bar in an almost horizontal position, and is then brought to the ground as rapidly as possible. In the meanwhile, the left leg, with the knee pointing outward, is brought up rapidly as the body passes over the bar and is carried forward to the ground, thus constituting the first of the three strides.

The practised hurdler manages to gather up his legs in clearing the hurdle in such a way that only an inch or two intervenes between his body and the top bar.

HINTS TO BEGINNERS

A beginner must remember that the hurdle must be cleared in a stride (i.e., he must rise from one foot and alight on the other), and that he must in no case jump it; he will soon discover that jumping the hurdle will necessitate his taking five strides instead of three. Godfrey Shaw, of the London Athletic Club, probably the finest hurdler this country has produced, clears as much as fifteen feet in his stride over the hurdle, thus leaving the same distance to be accounted for in the three strides before rising at the next, and goes over the ten hurdles without so much as touching one. It will be seen, therefore, that the three strides, which appear almost insuperable to the novice, average only five feet each, or much less than he would be taking if running one hundred yards on the flat.

Should the beginner find (as he no doubt will) that the regulation hurdles are too high, he should commence by practising over three or four obstacles of about two feet six inches in height, but always ten yards apart.

When he can accomplish the three strides over these, he should gradually increase the height and number of the obstacles.

There are several qualities necessary for the making of a crack hurdler. He must have speed and jumping power (hence it is that good hurdlers are frequently good long jumpers); he must have, too, dash and determination, and not be afraid of falling or barking his shins. That there are comparatively few hurdlers may be attributed to various causes. Among other reasons, this branch of sport is not supported or encouraged by athletic clubs as it should be, by facilities being given for proper practice, or by including hurdle competitions in their programmes. Again, few good sprinters will take to hurdling, as there is little doubt that the mechanical and artificial action necessary in hurdling interferes with speed on the flat.

With regard to training for hurdle races, constant practice is the thing most needed; rigid dieting is comparatively unimportant.

In hurdle handicaps, where men have been known to give as much start as twenty-five yards, the runner most heavily weighted starts so many yards behind the scratch, and is usually described as "owing so much." Thus the limit, or longest start competitor, is usually placed on the scratch; though it sometimes happens that, on account of the length of the course being limited, the longest start man is placed as much as five yards in front of scratch, and has then only ten yards to run before reaching the first hurdle.

Finally, the beginner must remember that, in hurdle racing, constant practice will probably effect greater improvement than in any other branch of athletic sports. Frequently men who as novices are very slow, and who have the greatest difficulty in mastering the three strides, develop eventually into first-rate hurdle racers.

SPORTS AND GAMES

High Jumping

By REGINALD WILLIAMS

ONE of the prettiest of our athletic pastimes has of late years been much neglected by sports-promoters. Popular opinion has always held the view that the high jumper is a freak of nature possessed of wonderful "spring," the seat of which is usually supposed to be in the instep and toes. No view could be more erroneous. High jumping may be, in special cases, a gift, but is almost invariably the result of long and constant practice; nor is the jump accomplished by a spring from the toes. It is in reality done from the knees, off the flat of the foot, and, in many cases, the heel. This latter is easily verified by examining the "take-off" on a soft day, when the heel mark is always very prominent. The methods of jumping are various, but two main types predominate—viz., the straight jump, and the sideway, or scissors jump. The pure straight jump—i.e., lifting the knees directly up to the chin and so crossing the bar—is rare, and is more usually combined with the "shoot," or twist. The principle in all methods is the same. The first effort of the would-be aspirant to fame is to get his feet over the bar, and with this end in view, always to practise at a higher bar than he thinks he can clear.

Never allow him to raise the lath himself, as by so doing he is aware of the height he is essaying, and knows exactly when he has reached his usual limit. By employing an assistant to raise the lath, he is unaware as to the exact height, and often clears more than he expects. Having learnt to raise his feet, he must now endeavor to raise his body in the air by a muscular contraction and also by using the limb, or limbs, which are over the bar as a lever: at the same time, by means of a twist or shoot, and a sudden lifting of the arms over the head, he must so alter his position in the air that his feet, which have previously been as high as, and in many cases higher than, his head, now point directly downward, and by this means he will lift his body and buttocks clear of the bar. It will thus be seen that, instead of a single spring, several separate actions constitute the true jump. In fact, his endeavor should be to climb over the crossbar in sections, first the feet, then buttocks, and lastly the upper part of the body.

It is essential to find a level spot from which to take off at a given distance from the bar. Practice alone will determine the correct spot for each individual performer. This spot should be fixed, and always adhered to. A simple method in practice is to stick a hair-pin through a piece of paper, which thus catches the eye.

The length of the run varies with each individual, but should be short for the low jumps, and gradually lengthened for greater heights, and should be as long as it can be made without tiring the muscles, as the momentum hereby gained allows more time for executing alterations in position while in the air. The last three steps should be somewhat longer than the others, and of the nature of slight jumps, and should, like the take-off, be fixed.

As to training for jumping, all the muscles of the body must be in good condition. Sprinting is excellent; gymnasium work is also good. All toe-exercises are useful, especially skipping; in short, all exercises tending to strengthen the muscles round the knee-joint. One should never jump more than three days a week, and never within four days of a competition, as the muscles are apt to lose elasticity. Stiffness must be vigorously guarded against. High kicking is very useful during the off-season.

One's shoes should be light, strong, and tight-fitting, and should, in addition to the ordinary toe-spikes, contain three heel-spikes arranged in triangular form, with the apex of the triangle posteriorly. If possible, loose earth should always be used to jump into, as by this means the jar which always follows on landing is greatly diminished.

But infinitely more important than all of these are the qualities of self-confidence and pluck, without which no one need hope to become a successful exponent of jumping.

SPORTS AND GAMES

The Broad Jump

By C. B. FRY

LONG jumping ability is made up of two elements, pace and spring. Pace in the run-up supplies the impetus; spring enables the jumper to lift himself into the air so that this impetus has time to act before the law of gravitation takes effect, and also adds a certain amount of forward motion itself. A man who can jump well, but is a slow runner, can achieve a certain degree of success in the long jump by virtue of his spring alone; similarly, a fast runner, without much jumping power, can cover a certain distance, if he learns to rise a little at the end of his run. The best kind of long jumper is the man who is both a fast runner and a capable high jumper.

Thus it is clear that in training for the long jump, besides practising the long jump itself, a man must cultivate his sprinting and high jumping powers to their highest pitch. Practice at the long jump will enable him to combine the two skilfully.

Before beginning such definite training, it is necessary, first to get into general condition by playing cricket, football, or any other game that gives good exercise; or to go through a course of grinding walks. Then should follow a week or fortnight of easy exercise on the cinder-track, consisting chiefly of sprinting and a little high jumping. This preliminary training will have got the muscles used in the long jump into working order, and actual practice may then begin. An experienced performer will not require more than a month's further practice to produce his best effort, though some men prefer to take much longer. Both in preliminary and in actual training for this event, it is absolutely essential not to do too much work a day. Two or three days a week may be given to serious long jumping, prefaced by about three high jumps and two or three short sprints. The other days should be devoted to serious high jumping and determined sprinting. A novice who has to learn the way to long jump must give himself six or eight weeks in order to obtain sufficient practice without overworking himself. Hurdling is an excellent subsidiary exercise for a long jumper, and it is a good thing to run over the entire length of flights or to take three or four flights four or five times. Hurdling and long jumping ability often go together, but if a man wishes to train simultaneously for both events, he must give himself long enough to practise both adequately without having to do too much work a day.

The long jumper's sprinting practice should be very much the same as that of a pure sprinter. He should confine himself chiefly to short bursts of forty yards, with an occasional run through the hundred yards, varied by a stride over three hundred or a lap well on his toes.

In his high jumping practice he may follow the methods of the professed high jumper, supplemented with occasional "high-long" jumps—i.e., over a lath fixed at from four feet six inches to five feet and taken at the end of a fast run of about twenty yards.

With regard to actual practice at the long jump, he must aim at three things—to learn to take-off with the ball of his foot on the taking-off board; to do that when going at full speed; and to jump as high as possible into the air.

There are two reasons for taking-off on the board: first, that if the jumper takes-off behind it he is not credited with the full distance he has covered, all jumps being measured from the edge of the board nearest the pit to the hindmost heel-mark; secondly, because the board is firmer and more springy than the cinder-track. When a jumper takes-off six inches behind the mark, he loses a foot, if not more. This accuracy in taking-off is partly mechanical and a matter of practice, partly a matter of eye. When a man is fit and in good jumping fettle, his eye, brain, and foot work so well together that he takes off exactly where he intends. At the same time, it is fatal to look at the taking-off mark while running-up. His eyes ought to be fixed early on a spot where he hopes to land—i.e., somewhat *beyond* his usual jumping distance. It is most helpful to have a piece of paper put about a foot further than he has ever jumped. It not only takes his eyes off the board, but draws him out. In order to gain mechanical accuracy, a mark should be made on the cinder-track. Behind this the jumper should start and, after a few yards' run, plant his toe on it, continue at full speed up to the board, and then jump determinedly. In nine cases out of ten he will have taken-off behind the board, as can be seen by examining the track. Before starting for the next jump, the mark should be moved forward as many inches or feet as he took-off behind the board.

It is a great mistake to shorten or lengthen the stride in running up. It not only makes it impossible to acquire and practice mechanical accuracy in taking-off, but lessens considerably the impetus which is the *raison d'être* of the run-up. The length of the run-up should be between forty-five and fifty-five yards. Practice will soon discover the suitable length. A man's run-up to a long jump should be the facsimile of the first part of a hundred yards as run by him. The whole run should be a winding-up for the jump.

The reason for jumping high has been mentioned. The difference between a first-class and a moderate performer in this respect is most marked. It is possible to jump too high, just as a cricket ball may be thrown too high for length; but at the end of a run-up at full speed it is practically impossible. As a working rule, it is safe to advise a long jumper to jump as high as he can—i.e., much higher than he feels inclined.

The best kind of shoes for long jumping are ordinary hurdling shoes, with one or two spikes in the heel. It is useful to have a pair for practicing with thickened heels, as the heel is planted with great violence on the ground in taking-off. *Bruised-heel* is a common complaint with long jumpers. Care should be taken that the pit is well dug up and softened before jumping, and that no rake, spade, or other edged tool is left near the pit, in case of a sprawl or fall out of the pit after landing. It is a good thing, especially in cold weather, to rub the legs and back well before starting work. A gentle sprint, and two or three small high jumps as preliminaries, should always be taken, in order to get the muscles into working order and prevent them being strained or torn by the sudden concentrated effort implied in a long jump.

SPORTS AND GAMES

Pole Jumping

By REGINALD WILLIAMS

OWING to a few unfortunate accidents, usually resulting from lack of care in the selection of a suitable pole, this, one of the oldest of our English sports, has practically dropped out of the list of events of most sports-holding clubs. This is deeply to be regretted, as in addition to being a most popular item with spectators, it is in itself a splendid exercise, demanding much all-round ability.

Broad jumping with a pole was for many years a necessity, and subsequently a sport, in the Fen districts of Lincolnshire and Cambridgeshire, and from this doubtless the pole-jumping of the present day had its origin. It seems strange that broad jumping with a pole should never have found its way into our athletic programmes; but as sports-promoters are ever on the look-out for attractive novelties, it is possible that it may yet be seen. Though originating in the Fens, pole-jumping is now almost entirely confined to the Furness district of Lancashire, and is especially associated with the town of Ulverston, from the immediate neighborhood of which most of our recent champions have sprung. Here it still retains its hold on the people, and may it long do so! He who would attain excellence in this branch of sport must be at once a jumper and a gymnast, and must have no lack of pluck, for strains and bruises are of common occurrence.

There are two distinct types of pole-jumping, the old and by far the more graceful type, and the new, or what may be called the *gymnastic*, type. The old type of jumper, now rapidly becoming extinct, grasped the pole firmly in the lower hand slightly below or on a level with the jump he was about to attempt, took a longish run, and having planted the pole firmly in the ground about one foot in advance of a horizontal line drawn between the bases of the two uprights, sprang into the air, throwing his feet as high as possible, and then with a twist raised his body clear of the lath, being careful at the same time to loosen his grip and throw back the pole before the lath became displaced.

In contradistinction to this, the new type of jumper, running slowly to the take-off, springs into the air, and the moment his pole assumes the perpendicular, climbs rapidly hand over hand up it, and with a quick lift raises his legs and body clear of the bar. This method, though demanding great ability, is, we think, more in the nature of a gymnastic display, and should, we venture to suggest, be confined to such competitions. Though recognized as legitimate pole-jumping by the English Amateur Athletic Asociation, it has never been recognized or allowed by the A. A. A. of America.

To turn now to practical details. The first thing to do is to procure a good, strong, flexible pole, as light as is consistent with safety, not less than eleven feet in height, made of ash or hickory. It should be thickest at the base, which should be shod with three steel spikes arranged in the form of a tripod, and these should be firmly secured by a metal ring. This gives a firmer grip than one spike. The pole should gradually taper from below upward. The uprights should be square.

The take-off should be selected with great care, and a pit of large dimensions provided on the landing side, which should be filled in with sawdust and earth. By these means many a jar and accident will be avoided. High jumping must be assiduously practiced and also gymnastic exercises of all kinds, rope and pole-climbing being essential.

SPORTS AND GAMES

Lacrosse

By J. D. CHAMPLIN and A. E. BOSTWICK

THIS is an outdoor game, played by twenty-four persons, twelve on a side, each of whom has a racket, or crosse (from *La Croix*, the bishop's crozier), as described. It is an Indian game. At each end of the playing field, which is as near one hundred and twenty-five yards long as possible, is a goal consisting of two posts, six feet high and the same distance apart. Each side faces one of these and tries to carry or throw toward it with the crosse a solid rubber ball, somewhat smaller than a baseball. The side that succeeds in propelling the ball through their opponents' goal, either by throwing or striking it with the crosse, or by kicking it, scores a goal, and the side that gains the greatest number of goals in the allotted time wins the game.

The titles of the players and their positions at the beginning of the game are given below, those defending the lower goal being in italics.

(Goal)
Goal-keeper

Point	*Inside Home*
Cover Point	*Outside Home*
First Defence	*First Attack*
Second Defence	*Second Attack*
Third Defence	*Third Attack*
Center Field	*Center Field*
Third Attack	*Third Defence*
Second Attack	*Second Defence*
First Attack	*First Defence*
Outside Home	*Cover Point*
Inside Home	*Point*

Goal-keeper
(Goal)

The players generally remain near these positions throughout the game. In the defence half of the field, the players, as a rule, try to throw the ball as nearly as they can the full length of the field, and at the same time land it at about cover point at the other end; while the attack half usually run toward their opponents' goal until "checked," or stopped, when they "pass" the ball to another of their team, who, in turn, does the same, each player returning to his original position upon surrendering the ball. Thus, if the attack are well trained and play well together, one of them will eventually have a good opportunity to "shoot for goal." At the opening of the game, the ball is "faced" in the center of the field; that is, placed on the ground there between the crossed sticks of the two opposing players whose positions are each center (see list of positions), and who must each have one knee on the ground. When "play" is called, each center has one of three methods of play to adopt: either he can use some trick to obtain the ball himself (and this is the most frequently used), or else he can draw his stick rapidly away, trying to force the ball behind him, where one of his team is always ready to receive it, should the center be successful. In the third and last method, which the Princeton College Lacrosse team invented, he may, by jumping up on his feet and keeping his body between the ball and his opponent, give a player on his side a chance to run up and obtain the ball. The ball must not be touched with the hand, however, at any time, by any player, except the goal keeper. He who succeeds in getting it after the "face" may strike it with his crosse, run with it in his crosse, or throw it by means of his crosse. The opposing team try to get the ball from him, either by striking his crosse with their crosses, or by "body-checking" him, that is to say, running into him bodily. Care must be taken, however, not to run against an opponent's back, and not to use one's hands, arms, or legs in "body-checking."

A line drawn six feet in front of each goal is called the "goal crease," and no attacking player is allowed inside it until the ball has passed Cover Point. The goal-keeper, while defending the goal, stands inside the "goal crease," and is allowed privileges that are denied to the other players.

Picking up and Carrying.—A player, when running, always picks up the ball by pushing his crosse under it; when standing, however, he hooks the ball toward him with his crosse and then pushes it under, the ball rolling on by its own impetus. In pushing the crosse, the player leans down so that it will not make too great an angle with the ground. When the ball is already running toward the player he has merely to let it roll up on his crosse, but the crosse must be held at a greater angle the faster the ball is coming. If the ball is rolling very fast and the crosse is held so as to offer too gentle an incline, the ball is likely to bound up into the player's face. If the ball comes on a swift bound, the player should be able, by not standing directly in front of it, to catch it in his net without any difficulty, the old idea of "blocking," or knocking it straight downward and catching it when it rises, being entirely given up, nowadays, as in doing that too much valuable time is lost. When it comes on the fly it is received on the net, the crosse being drawn back slightly as the ball strikes it.

A "liner" is caught by a player's moving to one side, holding his crosse in a horizontal position, and allowing it to "give" a little when the ball strikes it. All these movements (and many more could easily be described) require a great deal of practice to render them successful.

Running and Dodging.—As a rule, each team has its own method of play, but good critics consider it poor play to keep the men running until "checked"; it being far better to save their strength by teaching the defence to throw as far and as accurately as possible, and the attack to "pass" among themselves as quickly and accurately as possible. In running, the ball is held on the crosse, which is inclined slightly downward in front of the player, the inclination increasing with the speed. The ball is kept in place partly by the resistance of the air, and rests against the stick of the crosse, which is turned slightly to one side for the purpose. When the runner meets an opponent, he must take care to prevent the latter from striking his crosse, and at the same time prevent "body-checking." Sometimes he changes the crosse from one hand to another, or even turns his back, which makes it difficult for the enemy to get at his crosse. Sometimes, with a quick wrist movement, he throws the ball over his opponent's head, or to one side, running on and catching it again before his antagonist has time to turn. On the other hand, the player who is trying to get the ball strives to knock it out of the runner's stick, or else, which is far more customary nowadays, he tries to upset him by "body-checking." One method of knocking a ball out of a runner's stick is to strike the crosse down, not hitting the ball, which may then be caught in the air.

Throwing.—This is the term applied nowadays strictly to the defence who "throw" the full length of the field. The act of sending the ball from one attack man to another is now termed either "tipping," or "passing," and that of attempting to send the ball between the posts a "shoot for goal." When an attack player with the ball finds that he can run no farther and that dodging is useless, he passes the ball to another player on his own side—either one who is farther forward, or who has a clear field before him. There are many kinds of throws, of which only a few will be described here. Of defence throws, the best is to turn the back in the direction in which the ball is to be thrown and raise the crosse straight up, so as to throw over the head. Skillful players throw thus with great accuracy of aim, and the plan has the advantage that, as the thrower's back is toward the checking player, it is hard for the latter to interfere.

The crosse must be turned sidewise a little to prevent the ball's falling off, as the player turns, and the throw is made chiefly from the elbow, the crosse being stopped suddenly just before the hands touch the face.

Perhaps the most universal, and certainly the best attack throw is made by bringing the crosse around to the right side, then raising it, and throwing from the shoulder.

Tipping may be done in two ways: either by a single player's tossing the ball a foot or so and catching it again, repeating this performance as he runs, or else by two players running along together, and as each is compelled by opponents "checking" them to do so, tossing or passing the ball a few feet from one to the other. Other details of the game are given in the playing rules of the New England Amateur Lacrosse Association, from which we take the following:—

RULE 1.—*The Crosse.* The crosse may be of any length to suit the player; woven with catgut, which must not be bagged. ("Catgut" is intended to mean rawhide, gut, or clock-strings; not cord or soft leather.) The netting must be flat when the ball is not on it. In its widest part the crosse shall not exceed one foot. A string must be brought through a hole at the side of the tip of the turn (to prevent the point of the stick catching an opponent's crosse). A leading string resting upon the top of the stick may be used, but must not be fastened, so as to form a pocket, lower down the stick than the end of the length strings. The length strings must be woven to within two inches of their termination, so that the ball cannot catch in the meshes.

RULE 2.—The ball must be of sponge rubber, manufactured by the New York Rubber Co. In each match a new ball must be used, furnished by the home team. It shall become the property of the winning team.

RULE 3.—The goals must be at least one hundred and twenty-five yards from each other, and in any position agreeable to the captains of both sides. The top of the flag poles must be six feet above the ground, including any top ornament, and six feet apart.

RULE 4.—*The Goal Crease.* No attacking player must be within six feet of either of the flag poles, unless the ball has passed cover-point's position on the field.

RULE 5.—*Names of Players.* The players on each side shall be designated as follows: "Goal-keeper," who defends the goal; "Point," first man out from goal; "Cover-point," in front of Point; "Center," who faces; "Home," nearest opponent's goal; others shall be termed "Fielders."

RULE 6.—*Miscellaneous.* The game must be started by the referee facing the ball in the center of the field between a player on each side. The ball shall be laid upon the ground between the sticks of the players facing, and when both sides are ready the referee shall call "play." The players facing shall have their left side toward the goal they are attacking, and shall not be allowed to use a left-handed crosse.

A match shall be decided by the winning of most goals in every match, unless otherwise agreed upon. Games must in all cases be won by putting the ball through the goal from the front side.

Either side may claim at least five minutes' rest, and not more than ten, between each game.

The time of game shall be two half hours, with ten minutes rest between.

No change of players must be made after a match has commenced, except for reasons of accident or injury during the game.

Should any player be injured during a match, and compelled to leave the field, the opposite side shall drop a man to equalize the teams. In the event of any dispute between the field captains as to the injured player's fitness to continue the game, the matter shall at once be decided by the referee.

RULE 7.—*Spiked Soles.* No player must wear spiked soles or boots, and any player attempting to evade this law shall be ruled out of the match.

RULE 8.—*Touching Ball with the Hand.* The ball must not be touched with the hand, save in cases of Rules 9 and 10.

RULE 9.—*Goal-keeper.* The goal-keeper, while defending goal within the goal-crease, may pat away with his hand, or block the ball in any manner with his crosse or body.

RULE 10.—*Ball in an Inaccessible Place.* Should the ball lodge in any place inaccessible to the crosse, it may be taken out with the hand, and the party picking it up must "face" with his nearest opponent.

RULE 11.—*Accidental Games.* Should the ball be accidentally put through a goal by one of the players defending it, it is game for the side attacking that goal. Should it be put through the goal by any one not actually a player, it shall not count.

Should the ball catch in the netting, the crosse must be struck on the ground to dislodge it.

RULE 12.—No player shall throw his crosse at a player or at the ball, under any circumstances: and such action will be considered a "foul." Should a player lose his crosse during a game, he shall consider himself "out of play," and shall not be allowed to touch the ball in any way until he again recovers it. Kicking the ball is absolutely prohibited to players without a crosse.

The game of Lacrosse, in one form or another, is said to have been played by the North American Indians from a very early time, to teach their young men strength and endurance. The game is described by early French missionaries to Canada, and the Jesuits named it La Crosse, from the stick with which it was played, which resembled the French *Crosse* or hockey-stick. The original meaning of the word is a bishop's staff, or crozier, shaped something like a hockey-stick. The Chippewa name was *Baggatinaway.* On June 4, 1763, the fort at Michilmackinack (now Mackinaw, Mich.) was surprised and taken from the English by a party of Indians who pretended to be playing a game of Lacrosse. The game is still a favorite with the Canadian Indians, among whom are to be found its finest players. It is widely played by Canadians, and has been called their national game, holding the same place with them that baseball does in this country. It has lately been introduced in the United States, where it finds some favor and numerous clubs have been organized to play it.

SPORTS AND GAMES

Lawn Tennis

By N. L JACKSON

ALTHOUGH acknowledged to be the most modern of our national pastimes, lawn tennis in all probability had its origin in the ball games which were played in England and on the Continent some three or four hundred years ago.

Implements of the Game.—To enjoy lawn tennis it is necessary that the accessories should be of the best. The posts should be easily removable, but perfectly rigid when in position. A strip of stout white canvas about two or three inches wide should run across the top of the net so as to be seen easily by the players, and the net should be stout and strong. A flexible center stay, to keep the net at the right height in the middle, is preferable, but a metal one is frequently used, and this does not present any great disadvantage. Side posts for use when a single game is played on a double court should also be provided, and these should be placed at a distance of eighteen inches from the outside line of the double court and three feet from the side line of the single court. Stop netting to prevent the balls from traveling too far away is a necessity, unless the court is enclosed. This should be placed about twenty-one feet behind each base line and should extend for about fifty-four feet. The netting should then be continued diagonally, but almost parallel with the side lines for another thirty feet on each side. It is as well to have the netting about seven feet high. It can be placed on movable posts, and the whole can be removed and packed away in ten minutes. The balls should be of the authorized size and weight.

The Racket.—So much depends upon the fancy of the player in adopting a racket to suit him or her that it is difficult to give any reliable advice, but as the game developed fancy shapes and eccentric ideas gave place to a straight-faced racket, with an octagonal handle. The weight should be from fourteen and one-quarter to fourteen and three-quarter ounces for a man, and about an ounce and a half less for a lady. The racket should balance when the finger is placed under the screw below the head; but in this players differ somewhat, as a base line player often prefers a little more weight in the head, while a confirmed volleyer prefers the heavier part in his hand. For a beginner, however, it is better to have a well-balanced racket made by one of the best makers. Avoid lop-sided or small-faced rackets, and see that the grain in the frame runs equally round the face. It should be tightly strung, so that when the gut is smartly struck it will emit a musical sound. Be careful not to select a small handle. All the best players use large handles, and nearly all have a rim of leather at the end of the handle to prevent it slipping through the fingers. The racket should not be gripped too tightly, and it should be held in such a way that the forehand and backhand strokes can be played alternately without shifting the fingers. Dr. Dwight, the first player to publish his views of the game, gives the following excellent advice with reference to holding a racket: "Lay the racket on a table with the smooth side up. Open the hand with the thumb nearly at right angles with the fingers, and then clasp the handle in such a way as to make its upper right edge (or what would be its right edge if it were cut square) fit into the hollow of the joint between the thumb and forefinger. In closing the fingers on the handle, do not put them directly round it, but with the first joint of each finger slanting up the handle, which will cause the top joints to slant down the other way. The first two fingers should be a little separated from the other fingers and from each other. The end of the handle should be well within the hand, with the little finger round the leather rim. The thumb should not go round across the fingers, but should slope upwards across the upper side of the handle." Nearly every player has a natural way of holding a racket, and this it would be difficult to overcome; but by learning to copy the orthodox style a beginner is more likely to play in good form.

The Strokes.—First of all, a player should become thoroughly accustomed to handling his racket, and should practice the motions of hitting, driving, serving, and smashing, both forehand and backhand. It is also a good thing to knock a ball against a wall, returning it sometimes after it has bounded on the ground and at others as it comes direct from the wall. The player should remember that when making a forehand stroke his left foot should be in front and his body turned very slightly to the right. For a backhand stroke the body should almost face the left side line, toward which the toe of the left foot should point, while the right leg should be in front, and also inclining toward the left side line. Of course for a left-handed player these instructions must be reversed. Be careful not to commence the movements for a stroke until the latest moment possible. One of the greatest errors among beginners is their anxiety to get to the ball too quickly, instead of waiting for the ball to come to them. Always remember to strike the ball on its downward course and never as it is bounding up from the ground. Only the most expert players are able properly to play a rising ball.

The Service.—There are two generally adopted methods of serving, one the overhand, for which the ball is thrown in the air and struck by the racket at a point almost as high as the player can reach; the other, chiefly adopted by ladies, the underhand service, for which the ball is dropped toward the ground and struck when within eighteen inches or two feet of it. There are, however, many other ways of serving; and the usefulness of mastering these has been shown by many good players, notably by Dr. Dwight, Mr. E. G. Meers, and the Messrs. Renshaw. For the ordinary overhand service, the ball should be thrown up in line with the right ear and slightly backward. It should be struck by the racket just as it reaches its greatest height. If the service is intended to be a fast one, the racket should be used with a full face to the ball, but for a slower service with some cut on it the face should be diagonal, and drawn across the ball at the moment of striking. By the same rule a great deal of cut can be imparted to the underhand service by moving the racket sharply from left to right, or vice versa, when in the act of striking. As a rule, however, these fancy services are not of much use. A good hard service, *well placed*, so as to make the striker-out (i.e., the server's opponent) move from the position he has taken up, is the most reliable. Remember that at the moment of serving the body should be thrown well forward.

The Return of the Service.—Many players who have become proficient in most of the strokes are unable to make their knowledge useful because they have never mastered the true methods of returning the service. This, indeed, is the most important stroke in the game. Should it be well made the striker at once assumes the advantage, but should it be weak or badly placed the server is almost sure to win the stroke. If the service is a very fast one, the striker-out must be content to return the ball into his opponent's court, doing this with as much force as possible; but should the service not be severe, then the ball should be returned straight down the side line or diagonally into the furthest corner of the court. Be sure to keep a good length, that is, to return the ball as near your opponent's base line as possible.

Base Line Play.—Novices should devote themselves entirely to learning the base line play until they are fairly proficient at it. The volleying can soon be picked up afterward. The base line strokes may be divided into two classes, the underhand and the horizontal. On a hard court, the latter should be adopted, but under other conditions the former is the best. For the horizontal stroke, the racket must be held at right angles with the body, the head being slightly higher than the hand. The ball should be struck just as it is at the top of the bound, or is beginning to drop, and the stroke should be made from the elbow, the arm being straightened as the ball is struck. For the underhand stroke, which is preferable to the other when practicable, the racket is held perpendicularly. The ball is struck when it is a little to the right front of the right foot, and the head of the racket should, at the moment of striking, be a little behind the hand, so that the wrist may be used in completing the stroke. The direction, too, should be imparted by the wrist, a slight turn of the racket to one side or the other effecting this. It is because of the direction being given at the last moment that this stroke is so useful, for the opponent is not able to get into position before. The cardinal point, however, in this and in all strokes, except when a lot of cut is required, is to remember to send the racket after the ball. Do not make a sharp, choppy stroke, but let the racket swing straight through even long after the ball has left it.

The Volley.—No player can attain to any great degree of proficiency without learning to volley. There are more varieties of strokes in volleying than in any other method. There are forehand and backhand volleys, high volleys and low volleys, straight volleys and dropping volleys, and the "smash." The racket must hit the ball and not be held for the ball to rebound off it. It will be found advantageous to take a step with the foot furthest from the ball just before the moment of striking. Here again Dr. Dwight's sound advice cannot be improved upon. "As an example," he writes, "take the ordinary forehand volley at about the height of the shoulder (a very common stroke). The elbow should be away from the body and not down by the side, the wrist a little bent upward, and the head of the racket above the hand. In striking, the weight is thrown forward on to the left foot, which is brought out with a good step in front of the right foot and a little across it. There is no preliminary swing of the racket backward. The head of the racket should be brought forward on to the ball with a sharp bend of the wrist, and the arm should be straightened to nearly its full length. The racket should not be checked suddenly after striking the ball, but should swing well forward. The elbow, shoulder, and wrist should all be left free, and not held stiff, while the stroke is made. The backhand volley is made in much the same way. The elbow should be raised and away from the body, the head of the racket should be just on the left shoulder, and the stroke should be made by stepping forward with the right foot, straightening the forearm, and bringing the head of the racket sharply forward by bending the wrist. It is this turn of the wrist at the last moment of the stroke that gives sharpness and character to all volleys." The low volley is a much more difficult stroke, but it should be cultivated, because it saves time and returns the ball quicker than your opponent expects, and before he has time to correct his position. The "smash" is made from a slowly dropping ball, usually after a bad stroke by one's opponent. In this all the joints are left free, the only object being to hit the ball as hard as possible into the opponent's court. Mr. William Renshaw once gave the writer a terse but perfect illustration of how to smash. "Do it," he said, "just as if you were going to hit some one over the head with a stick." The motions are really identical. When possible, a volley should be placed as carefully as a ground stroke, and only a smash should be made without regard to position.

The Half-Volley.—This is a stroke which should only be used in an emergency. A few players, notably Mr. E. W. Lewis, have so mastered it as to use it offensively, but as a rule a return from a half-volley is easily dealt with by an opponent, and therefore it should be avoided. It is a pretty stroke to watch, and occasionally saves time. It is made by striking the ball directly it rises from the ground, and, as the player cannot watch the ball when striking it, this can only be properly done by accurate timing. The racket should be held nearly vertical, having a slight forward inclination; and a sharp lift, or upward jerk, from the elbow, should be made as the ball is struck.

The Lob.—Lobbing is a stroke useful only to gain time or to drive a volleyer from the net. The ball should be tossed high into the air and should fall as near the base line as possible. If the opponent is close to the net a low lob, just out of his reach, should be made, because the ball will drop quickly; possibly before he can return to play it. To gain time, the higher the ball goes the better, particularly as it drops straight from a high lob and is therefore more difficult to volley. The forehand lob is much easier than the backhand. The ball should be taken well in front and the wrist should be held fairly stiff, the direction being given by the elbow.

General Principles.—Let the ball be returned as hard and as near the net as possible. Chiefly rely upon base line play, and never run up to volley until the opposing player is placed at a disadvantage. Serve hard for the first service, but for the second run no risks. A double fault is inexcusable. Learn to place the strokes as accurately as possible. To be able to do this, get a lad to throw balls to you, and let your object be to return them into a given space. Let this space from time to time be moved to different parts of the court. Try to ascertain your opponent's strong points and his weak ones. Avoid the former and pound away at the latter. Be sure to keep a good length; for, whether playing against a volleyer or a base line player, the further back he is kept, the longer is the time allowed you to see his strokes and get to the ball. Keep well away from the pitch of the ball, and do not commence your stroke until the ball rises. You can then see if the ball has bounded truly or has "broken" (as cricketers term it) to the one side or the other, owing to cut or to inequalities in the ground. Be sure to make yourself perfectly conversant with the laws of the game before playing it. Always keep your eye on the ball, watch it as intently as a cat does a mouse, and your hand will follow the more accurately. After going to the side of the court or toward its service line to return a ball, quickly return to the center close to the base line. Do not attempt too much; one point gained by a brilliant shot will not compensate for two or three lost through showy play. Never use bad balls. Always place the head of the racket in the left hand when not in the act of striking, and thus relieve the right hand of the constant strain it would otherwise be subjected to.

RULES OF THE GAME

(*As adopted by the National Lawn Tennis Association*)

The Court. 1. The court is seventy-eight feet long and twenty-seven feet wide. It is divided across the middle by a net, the ends of which are attached to two posts, standing three feet outside of the court on either side. The height of the net is three feet six inches at the posts, and three feet in the middle. At each end of the court, parallel with the net, and thirty-nine feet from it, are drawn the base lines, the ends of which are connected by the side lines. Half way between the side lines, and parallel with them, is drawn the half-court line, dividing the space on each side of the net into two equal parts, the right and left courts. On each side of the net, at a distance of twenty-one feet from it, and parallel with it, are drawn the service lines.

The Balls. 2. The balls shall measure not less than two and fifteen-thirty-second inches, nor more than two and one-half inches in diameter; and shall weigh not less than one and fifteen-sixteenth ounces, nor more than two ounces.

The Game. 3. The choice of sides, and the right to serve in the first game, shall be decided by toss, provided that, if the winner of the toss choose the right to serve, the other player shall have choice of sides, and vice versa, *or the winner of the toss may insist upon a choice by his opponent.* If one player choose the court, the other may elect not to serve.

4. The players shall stand on opposite sides of the net; the player who first delivers the ball shall be called the server and the other the striker-out.

5. At the end of the first game the striker-out shall become server, and the server shall become striker-out, and so on alternately in all the subsequent games of the set, or series of sets.

6. The server shall serve with one foot on the ground immediately behind the base line; the other foot may be anywhere except touching the base line on the ground within the court. He shall deliver the service from the right to the left courts, alternately beginning from the right.

7. The ball served must drop between the service line, half-court line, and side line of the court, diagonally opposite to that from which it was served.

8. It is a fault if the server fail to strike the ball, or if the ball served drop in the net, or beyond the service line, or out of court, or in the wrong court; or if the server do not stand as directed by Rule 6.

9. A fault cannot be taken.

10. After a fault the server shall serve again from the same court from which he served that fault, unless it was a fault because he served from the wrong court.

11. A fault cannot be claimed after the next service is delivered.

12. The server shall not serve till the striker-out is ready. If the latter attempt to return the service, he shall be deemed ready.

13. A service or fault delivered when the striker-out is not ready counts for nothing.

14. The service shall not be volleyed, that is, taken before it has touched the ground.

15. A ball is in play on leaving the server's racket, except as provided for in Rule 8.

16. It is a good return, although the ball touch the net; but a service, otherwise good, which touches the net shall count for nothing.

17. The server wins a stroke if the striker-out volley the service, or if he fail to return the service or the ball in play; or if he return the service or the ball in play, so that it drops outside of his opponent's court; or if he otherwise lose a stroke as provided by Rule 20.

18. The striker-out wins a stroke if the server serve two consecutive faults; or if he fail to return the ball in play; or if he return the ball in play so that it drops outside of his opponents' court; or if he otherwise lose a stroke as provided by Rule 20.

19. A ball falling on a line is regarded as falling in the court bounded by that line.

20. Either player loses a stroke if the ball touch him, or anything that he wears or carries, except his racket in the act of striking; or if he touch the ball with his racket more than once; or if he touch the net or any of its supports while the ball is in play; or if he volley the ball before it has passed the net.

21. In case a player is obstructed by any accident, not within his control, the ball shall be considered a "let." But where a permanent fixture of the court is the cause of the acci-

dent, the point shall be counted. The benches and chairs placed around the court shall be considered permanent fixtures. If, however, a ball in play strike a permanent fixture of the court (other than the net or posts) before it touches the ground, the point is lost; if after it has touched the ground, the point shall be counted.

22. On either player winning his first stroke, the score is called fifteen for that player; on either player winning his second stroke, the score is called thirty for that player; on either player winning his third stroke, the score is called forty for that player; and the fourth stroke won by either player is scored game for that player, except as below: If both players have won three strokes, the score is called *deuce*; and the next stroke won by either player is scored *advantage* for that player. If the same player win the next stroke, he wins the game; if he lose the next stroke, the score returns to deuce and so on until one player wins the two strokes immediately following the score of deuce, when game is scored for that player.

23. The player who first wins six games wins the set; except as below: If both players win five games, the score is called *game all*; and the next game won by either player is scored *advantage game* for that player. If the same player win the next game, he wins the set; if he lose the next game, the score returns to games all; and so on, until either player wins the two games immediately following the score of games all, when he wins the set. But the committee having charge of any tournament may in their discretion modify this rule by the omission of advantage sets.

24. The players shall change sides at the end of every set; but the umpire, on appeal from either player before the toss for choice, shall direct the players to change sides at the end of the first, third, fifth, and every succeeding alternate game of each set; but if the appeal be made after the toss for choice, the umpire *may* only direct the players to change sides at the end of the first, third, fifth, and every succeeding alternate game of the odd, or deciding, set. If the players change courts in the alternate game throughout the match as above, they shall play in the first game of each set after the first in the courts in

which they respectively did not play in the first game of the set immediately preceding.

25. When a series of sets is played, the player who served in the last game of one set shall be striker-out in the first game of the next.

26. In all contests the play shall be continuous from the first service till the match be concluded; provided, however, that between all sets after the second set, either player is entitled to a rest, which shall not exceed seven minutes; and provided, further, that in case of an unavoidable accident, not within the control of the contestants, a cessation of play which shall not exceed two minutes may be allowed between points; but this proviso shall be strictly construed, and the privilege never granted for the purpose of allowing a player to recover his strength or wind. The umpire, in his discretion, may at any time postpone the match on account of darkness or condition of the ground or weather. In any case of postponement, the previous score shall hold good. Where the play has ceased for more than an hour, the player who at the cessation thereof was in the court first chosen shall have the choice of courts on the recommencement of play. He shall stay in the court he chooses for the remainder of the set. The last two sentences of this rule do not apply when the players change every alternate game as provided by Rule 24.

27. If a player serve out of his turn, the umpire, as soon as the mistake is discovered, shall direct the player to serve who ought to have served. But all strokes scored before such discovery shall be counted. If a game shall have been completed before such discovery, then the service in the next alternate game shall be delivered by the player who did not serve out of his turn, and so on in regular rotation.

28. There shall be a referee for every tournament, who shall have general charge of the matches. There shall be an umpire for each match and as many linesmen as the players desire. The umpire may act as linesman also. The umpire shall have general charge of the match, and shall decide upon and call lets, and also decide whether the player took the ball on the first or second bounce. The umpire shall also decide

any question of interpretation or construction of the rules that may arise. The decision of the umpire upon any question of fact, or where a discretion is allowed to him under these rules, shall be final. Any player, however, may protest against any intrepretation or construction of the rules by the umpire, and appeal to the referee. The decision of the referee upon such appeal should be final.

The court shall be divided between the linesmen, and it shall be their only duty to decide each for his share of the court where the ball touched the ground, except, however, the linesmen for the base line, who shall also call foot faults. The linesman's decision shall be final. If a linesman is unable to give a decision, because he did not see, or is uncertain of the fact, the umpire shall decide or direct the stroke to be played again.

SPORTS AND GAMES

Paperchasing

By HAROLD WADE

IF a paperchase is to be successful, the details cannot be too carefully arranged. Two hares are chosen, preferably of equal caliber, possessing a knowledge of the surrounding country. They should, before starting, have a general idea of the course they mean to steer. Each hare carries a long sausage-shaped bag supported from his shoulders, packed tight with printers' waste strips, which are recommended strongly in preference to squares of paper. It is essential to the success of the chase that a continuous trail shall be lightly laid. If these ordinary bags are tightly packed, the paper, with judicious laying, will easily last ten miles. A clever pair of hares will lay several false scents to check the too rapid progress of the hounds, and by taking advantage of cover, and varying the nature of the country as much as possible, the run is made more interesting. The grace allowed the hares is usually ten minutes, but it should not exceed fifteen minutes, and the hounds can be despatched in fast and slow pack if found desirable; to maintain interest the hounds should always have a fair chance of catching the hares. Upon the hounds receiving a check, say in the middle of a field, the pack should at once spread out in fan shape, and on the scent being regained, the fact should be notified by bugle or call. The distance traversed will, of course, vary considerably, but it should not exceed ten miles, for there are few runners who can last a longer distance without undue exhaustion. Some runners maintain their stride throughout, and we have even known instances of men who have kept on their toes throughout a long journey; but the majority of runners are not strangers to a temporary feeling of fatigue during some part of the journey — it may be over plow or going up hill—but they are recommended to make the effort to maintain a jog trot rather than indulge in the luxury of a walk, because it is found that alternately walking and running materially increases the fatigue in the long run.

The dress suitable for cross-country running is a pair of twill knickerbockers cut fairly short, so as not to interfere with the action of the knee, a thin merino vest, and sweater if the weather be bad, and india-rubber or spiked shoes, the latter being preferable as giving a better grip on the ground.

The best training is to take long-road walks at a brisk pace, varied by occasional spins of two to four miles on the track or road, with a weekly run across country. Many runners fall into the fatal error of thinking the best form of training is to confine their work to cross-country, and to run from five to ten miles at repeated intervals. There could be no greater mistake, because they will quickly tend to become hopelessly slow, and moreover are likely to over-strain themselves, and be quite unable to make the extra effort that is often called for at the crisis of the race.

The question of pace plays an important part in a cross-country race, and our experience is that scratch and back-mark men will find it advantageous to make the pace hot from the start, as, if fit, they are likely to maintain it fairly evenly throughout; whereas it is often difficult to increase the pace after a slow start, and, as an illustration of this, we may instance a cross-country championship, where it is generally recognized that the leading twenty at two miles will furnish the first fifteen at the finish.

Over-anxious parents often place a veto upon cross-country running, but experience has amply proved that, given a sound constitution, the fear of over-strain is very little, and certainly no healthier or more invigorating recreation can be found.

SPORTS AND GAMES

The Game of Polo

By J. D. CHAMPLIN and A. E. BOSTWICK

POLO is the game of hockey played on horseback or roller skates. In the horseback game, called Equestrian Polo, the players ride on ponies not more than fourteen hands one inch in height, usually Mexican mustangs. The sticks, or mallets, are from forty-nine to fifty-two inches long, with heads of willow wood and flexible handles covered with buckskin. The balls are made of light wood. The grounds are about seven hundred and fifty yards long and five hundred feet wide, and have at each end two goal posts, twenty-four feet apart. At the beginning of the game the leaders toss for goals, and the players on each side take position in front of their goal behind a line drawn about twelve yards from it. The ball is thrown into the center of the field by the umpire, and the game begins. Sometimes the game is opened by "charging," in which case the players stand only a few feet from the ball, and rush upon it at the word "play"; but as this is hard on the horses, it is usually omitted, except in the opening game of a match. The object of the game, as in similar ones, is to strike the ball between the opposing goal posts, called winning a goal. A match game usually consists of three innings of twenty minutes each, with two-minute intervals for rest, and the side making the most goals in the sixty minutes of play wins the game. In case of a tie the game is continued till one party makes another goal.

The following are the rules of the Westchester Polo Club:—

1. The grounds to be about seven hundred and fifty feet

long by five hundred feet wide, with a ten-inch guard from end to end on the sides only.

2. The height of the ponies must not exceed fourteen hands one inch.

3. The balls to be of wood, with no other covering than paint, and about three inches in diameter. The mallets to be such as are approved by the steward.

4. The goal posts to be twenty-four feet apart and light enough to break if collided with.

5. Match games between pairs shall be for periods of thirty minutes, time between goals included, unless otherwise specified.

6. Match games between teams of four shall be three periods of twenty minutes each, actual play, time between goals and delays not counted, with ten minutes between the periods for rest, unless otherwise specified.

7. Each team to choose an umpire, and, if necessary, the two umpires to appoint a referee, whose decision shall be final.

8. Each team shall have a substitute in readiness to play when a match is on.

9. There shall be a captain for each team, who shall have the direction of positions and plays of his men.

10. No captain shall allow a member of his team to appear in the game otherwise than in the club uniform.

11. No person—players, umpires, and referee excepted,—shall, under any circumstances, be allowed upon the ground during the progress of the game.

12. It is forbidden to touch an adversary, his pony, or his mallet with the hand or mallet during play, or to strike the ball when dismounted.

13. The game to begin with a charge, the contestants taking their positions behind the chalk line, which is to be thirty feet from the goal posts. When the signal to charge has been given by the referee, the first and second players must keep to the left of the ball until it has been touched.

14. In case of an accident to a player or pony, or for any other reasonable cause, the referee may stop the game, and the time so lost shall not be counted. When the game is resumed

the ball shall be thrown between the players who shall be lined up at the point at which the ball stopped. But if the game is stopped on account of a foul the ball is to be thrown in at the place at which the foul occurred.

15. When the limit of time has expired, the game must continue until the ball goes out of bounds, and such overtime shall not be counted.

16. In case of an equal number of goals having been made at the end of the third period, the game to be continued until one side makes the winning goal.

17. When the ball goes out of bounds at the sides, it must be thrown in from the place at which it went out, by the referee, or by an impartial person, between the two sides, which shall be drawn up in line facing each other. When the ball goes out at the ends, the side defending that goal is entitled to a knockout from the point at which it crossed the line. When the player having the knockout causes unnecessary delay, the umpire may throw a ball on the field and call play. No opponent shall come within fifty feet of a player having the knockout, until the ball has been hit.

18. A player requiring a mallet during the game, must ride to the end or side line. It must not be brought on the field to him.

19. Foul riding is careless and dangerous horsemanship, and lack of consideration for the safety of others. A player in possession of the ball has the right of way, and no one shall cross him unless at such a distance as to avoid all possibility of a collision.

20. The referee may suspend a player for the match for foul riding, or he may award the opposing side a half goal.

SPORTS AND GAMES

Quoits

By F. T. POLLOK

THIS game is played by driving two iron pegs into the ground nineteen yards apart, but it can be altered by agreement to any distance varying from fifteen to thirty yards.

It is usual to fix on the weights of each quoit. The quoit is a flattened ring of iron, thick at its inner and thin at its outer edge; the pin is variously called spud, hob, or spike. To play it properly, a man should possess considerable strength in the arms and shoulders, and a quick eye will enable him to acquire the requisite pitch. The players are generally two or four—two on a side. Each player has two quoits and throws one round, endeavoring to make them fall over the hob; after each has had a turn, the first recommences, and so on, throwing back to the hob whence they commenced. The quoit is held with the forefinger along its outer edge, in which there is a small dent for the end of the finger to lie in without being cut. The two surfaces are held between the thumb and the other fingers, and the quoit is pitched with a slight rise and with a rotary motion to make it pass smoothly through the air. The score depends upon the quoit falling on the hob, or as near it as possible. A ringer, that is, a quoit which surrounds the pin, scores two; two ringers count four. If a player's two quoits are nearer the hob than his antagonist's, he scores two; if he has but one nearer, he scores only one, but when the nearest quoits are equi-distant, and belong to different players, neither scores.

The rules for playing and scoring quoits are as follows:—

1. The distance from pin to pin shall be as agreed; the player shall stand level with the hob and deliver his quoit with the first step.

2. No quoit which measures more than eight inches external diameter shall be used; the weights may be unlimited or as agreed upon.

3. The hobs to be an inch above the surface of the ground, which should be, if possible, clayey, or sufficiently soft for the quoits to be partially embedded.

4. All measurements should be taken from the pin to the nearest visible part of the quoit; the quoit and the soil must not be disturbed.

5. No quoit shall count unless fairly delivered in the clay free from the outer rim. No quoit on its back shall count unless it holds the clay, or is knocked out by another quoit. No quoit rolling on the ground shall count, unless it first strikes another quoit or the pin.

6. Each player must deliver his quoits in succession, his opponents then following.

7. The fiat of an umpire shall be final in cases of dispute.

CROSS-COUNTRY RUNNING.

SPORTS AND GAMES

Running

By MONTAGUE SHERMAN

BEFORE the days of organized athletics, runners were heard of who had the reputation of being able to beat their opponents at any distance. In the present days of highly specialized effort, a runner who essays all distances is likely to prove the master of none. One never hears to-day of a sprinter who can perform well at long distances, or of a long-distance runner who is anywhere near the front rank of sprinters; and the few all-round athletes who appeared in the early days of the athletic movement would, if they had been competing to-day, have been compelled to devote themselves to one particular class of distance, if they desired to acquire championship honors. Nowadays, a runner is either a sprinter—that is, accustomed to run from one hundred yards up to three hundred yards at full speed—in which case the limit of his special abilities will probably be a quarter of a mile at the outside—or he may run the middle distances—that is, from a quarter to a half mile; or he may be a long-distance runner, with distances from a mile upward. Men cannot, of course, be measured by exact standards, and he who can run a mile well and he who can run a quarter may often meet together on even terms at a half; but for purposes of rough classification, to divide runners into the three classes of sprinters, middle-distance men, and long-distance men, is to draw the dividing lines as closely as nature will allow them to be drawn.

Sprinting is the name given to the running of short distances at "full burst." Sprinting is perhaps more popular, both with spectators and athletes, than any other class of race, and a sprint handicap at one hundred and twenty or one hundred and fifty yards is likely to produce the largest entry of all at a sports meeting. But although the number of mediocre sprinters is large, the number of really fine sprinters is very small, and it is seldom that a man reaches his best form until after two or three seasons of steady practice.

Success in sprinting comes more from the rapid repetition of the stride by bringing up the legs quickly than from artificial attempt to lengthen the stride. The more the runner practices "bursts" of speed, the more he will find that his stride is naturally lengthening by his striding from the hips and not from the knees. The natural sprinter is nearly always a man of big thighs and strong back, and the capacity for attaining to really first-class form consists in being able to "put one's back into it," and to keep up a prolonged and vehement burst at high pressure throughout the whole distance one has to go. A great practical exponent of sprinting once expressed an opinion that to win a sprint, one should "run like a madman."

There is some truth in this: the sprinter has to learn to keep up an abnormal burst of speed, or he will be left behind.

To come to practical directions, the sprinter must continually practice short bursts of speed; he must stride well from the hips, so as to lose not an inch of his stride; should run as straight as an arrow goes from the bow; and should be careful not to throw his shoulders too far back, as this tends to shorten the stride: the rest must be left to natural capacity and to assiduous practice.

It is of immense importance to a sprinter to start quickly. Until about seven years ago the received method of starting was for the runner to stand on his toes with the right foot seven or eight inches behind the left foot so that it could be brought up quickly for the first stride, the body being kept square to the starting-line. Of late years most sprinters have taken to starting with both hands resting lightly on the starting-line. When the pistol is fired, the runner gathers himself up and darts forward, at the same time rising to the perpendicular. There can be no doubt that the new style is efficacious, as it is now almost universally adopted. It has undoubtedly rendered the starting of sprint races much easier and fairer, for while the runner has his hands on the ground he cannot "break away," from the mark, and if a runner "breaks away," he is, under the A. A. A. rules, put back a yard.

Frequent practicing at starts and bursts, and an occasional run over the full distance he is training for, should be the regular work of the sprinter; above all, he should never run alone, but have some one to sprint with him. When a man sprints alone, he often gets slow and sluggish without noticing it.

A sprinter must do his best, by one form of exercise or another, to get hard and muscular without getting stiff; for stiffness is fatal to speed. It is undoubtedly a good thing to be well rubbed over the back and legs after each day's practice.

On the day of his race, the sprinter should always take a short "burst" on his way down to the starting post to warm the muscles.

Sprinting requires at least as many weeks' practice as any other form of running; a month, at shortest, is necessary to acquire one's best form.

Middle Distances

A great many sprinters, after a little experience and with careful training, develop into fine quarter-milers. In fact, when a man is running four hundred and forty yards in less than fifty seconds, as many amateur runners have done and can do, he must obviously go at full speed nearly every yard of the distance. But there are many runners who are but indifferent sprinters, and yet can do marvelous performances at a quarter. From this it appears that it is fairer to describe a quarter mile as one of the middle distances.

The training for the distance should be entirely different for the two classes of men. The sprinter must be careful not to overdo himself and thus get jaded and slow, but he should frequently run spurts of three hundred yards, or thereabouts, to get used to prolonged effort, and must be very careful in his diet, so as to preserve every ounce of his staying power. The regular middle-distance man must train differently: he is usually a lighter man than the sprinter, and he can stand more hard work, but when once he has got moderately fit, what he requires most is speed, and he must assiduously practice sprinting and starting to improve his speed.

Again, when it comes to running the race, the sprinter must use different tactics to the middle-distance runner. He must use his pace when he has got it, that is at the beginning of the race, for after he has covered the third of the distance he will find that his power of "making a burst" is all but gone; the middle-distance man, who can rely on being able to finish out and to keep his stride to the end, wants a pacemaker, some one who will pull him out in the early stages of the race.

The sprinter, then, who wishes to include the quarter mile in his repertory must recollect that, although he has to get hard and strong, it is upon his speed that he must rely; and at all hazards he must retain his dash. He can lay the foundation of his staying powers by walking, which hardens the legs and back, or even by rowing, or by lawn-tennis or any hard exercise; but when he begins to train for his races, he must be careful not to get slow and stiff by pounding round the path at longer distances.

The half mile race produces perhaps the most interesting of all athletic contests. It lasts but two minutes, or thereabouts, and therefore cannot grow tedious, and it presents scope for staying power, judgment, and spurting. While many long-distance runners can do fine performances at half a mile, they are bound to be outpaced by the really fine middle-distance runner. There are plenty of instances of men who, though good at a quarter, have not sufficient speed to hold the sprinters, and good at a mile, yet are unable to keep amongst the first flight of milers, and yet at half a mile are magnificent runners.

The middle-distance men are bound to have a good deal of staying power, and should not be afraid to take a good deal of work. In practicing, they must learn to run to a watch; that is, to keep going all through the race by learning to run the first quarter fast. If a man wants to run half a mile under two minutes, he should do his first quarter in fifty-eight seconds, and nothing can teach him to know that he is keeping up his pace better than the "running to a watch" held by his trainer. He should frequently run quarter miles and six hundred yards in practice, and occasionally the full distance, starting to do his distances slowly when he begins his training, and gradually quickening up as he is approaching fitness and his best form. Nor must he forget to practice bursts of speed, as every runner is the better by improving his pace and by learning to make a sprint, but the main thing a half-miler has to achieve is to go strong and brisk in the early stages of the race. Many half-milers are inclined to be sluggish in the first stage, and for such the best tactics in a race are to start a runner, who will "make the pace" for them. The pacemaker can run his first quarter in fixed time, and he will thereby draw out the half-miler, who will hang not far behind him until he takes up the running after the half distance.

The pacemaker in such contests should have orders to run the first quarter in about a second faster than the "crack" requires to do the same distance, and this is pretty sure to produce the desired effect.

LONG DISTANCES

All distances from a mile up to four miles are common at meetings at the present day, nor is a five mile race by any means a rarity, and since paperchasing became popular, a ten miles flat race has formed part of the championship programme. It is hardly possible to separate long-distance runners into classes, and the only general remark that can be made as to the classification of long-distance men is that the lighter their weight the more likely are they to be able to spin over the long distance. The rules for getting fit for long distances are fairly simple; the runner must get down his weight, and do a lot of work. We do not, of course, mean to say that cases of men overworking themselves and getting stale are not common enough, but the long-distance runners succeed by their endurance and staying power, and are able to stand a lot of work, and every pound of superfluous flesh will tell in a long race.

It is by no means uncommon for a runner to hold the championship at one, four, and ten miles in the same year, which should prove the point we contend for, that all long-distance men belong to one class. To win the championships at one and four miles in the same year the runner has to do both races in the same afternoon. The ten miles championship is run in the spring at the conclusion of the paperchasing season, at which time all the long-distance men are likely to be as fit and hard as only paperchasing can make them.

For a man to work up to his best form in long-distance races, he must "run to a watch" in the way we have mentioned before. His trainer (or he himself after a season or two, for every man should soon learn to gauge his own strength and health) can judge on each particular day whether he should do a little more or a little less work, for this depends on the state of a man's health. It is a fatal mistake to attempt to get fit by doing too much work in a limited number of days. A slow and steady increase of work, which means doing the distance selected at a gradually increased pace, is the safest plan for success.

The runner who confines himself to the mile race only, must possess some considerable speed. The first quarter in a mile championship is often covered in a minute or thereabouts. As the distances get longer, scope is given to the man whose capacity consists almost entirely in being able to keep pegging away. But for all long-distance running the road to success consists in steady training, a quantity of work, and a rigid dietary.

Boys' Races

A word should be added as to running races for boys. It should be almost superfluous to say that growing lads should not be put to so severe training as men. The best foundation for training with boys is to let them have plenty of games, such as cricket or football. By these they harden the muscles and improve the wind. We are no believers in open races for boys. Every boy should be encouraged to run in his own school sports in classes with boys of his own age, but in these school sports there should not be many races of a long distance, and no long races at all for young boys who so often have more energy and spirit than strength. Boys also should be encouraged at schools more than they are at present to practice the high and long jump and pole jump. They afford plenty of amusement and healthy rivalry and can do nothing but good, and it is as natural for a boy to leap as for a kitten to play.

SPORTS AND GAMES

Steeplechasing

By HAROLD WADE

FOR many years past no athletic sports programme has been considered quite complete without a steeplechase, and at country meetings especially, this event provides more interest and amusement than any other. One would naturally have assumed that such encouragement would attract a larger number of cross-country runners to this undoubtedly good sport; yet not only have steeplechases of recent years at athletic meetings produced as a rule thin fields, but the class of competitor, with a few exceptions, has been distinctly poor. The explanation may lie in the fact that steeplechasers have enough discomforts to put up with in any case, and are not prepared to make themselves ridiculous for the amusement of the crowd by being asked to take almost impossible jumps. To a considerable extent sports managers have only themselves to blame for driving distance runners on to the flat.

A good steeplechaser must combine speed, endurance, and jumping ability, a combination which many of our cross-country runners possess to a marked degree, and which would bring them the highest steeplechasing honors if they turned their attention to the sport. The steeplechase course is generally laid out on a grass enclosure, and comprises a number of artificial obstacles placed at intervals of about eighty yards, generally in the form of hurdles, which should not be too difficult, say three feet in height and tipped with furze. The *pièce de résistance*, however, is the water jump, a ditch about six feet wide by two and a half feet deep, the approach to which is guarded by a solid structure such as a fence, more thickly studded with furze than the other hurdles, and which must be cleared and not rushed.

The favorite steeplechasing distances are from three-quarters of a mile to two miles, the amateur championship being at the latter distance.

It is surprising to note how few competitors take the obstacles scientifically, that is fly and not jump them. The obstacles should be taken in the stride as in the hurdle-race, so that the runner alights on one foot and at once resumes his stride. The generality of steeplechasers jump the hurdles, often clearing them by several inches, thereby uselessly exhausting energy; but the real fatality of this method lies in the fact that the runner alights on both feet, coming practically to a dead stop and entirely getting out of his stride. It is evident that a recurrence of this at intervals of every eighty to one hundred yards is not only exhausting, but loses an immense amount of time, probably several seconds in a mile. There is no necessity to clear the ordinary hurdle, as, if the timber is topped, the furze will yield to the impact of the body. The chief attraction, so far as the spectators are concerned, centers in the water jump, and it is here that the experienced steeplechaser is seen to greatest advantage. Unless he is a jumper of exceptional ability he never attempts to clear the ditch, but jumps into the middle of the water, with arms and body slightly bent forward, so that he may grasp the edge of the ditch with his hands, and spring out with a minimum loss of time.

There is usually not wanting the competitor who seeks to arouse the enthusiasm of the spectators by clearing the water jump, but the effort is very exhausting, and the exhibition steeplechaser is not to be taken seriously, as he seldom finishes in the first three. The usual rule of athletics as to passing applies to steeplechasing, but special care is needed in approaching the water jump, particularly if the men happen to be in a cluster. It is an unwritten law that the man just behind has the courtesy, to use a mild term, to swerve in his jump either to the right or left, otherwise a serious spiking accident is likely to occur. So many qualities combine to produce a good steeplechaser, that it is to be regretted that more good men do not apply themselves to cultivate the art.

A steeplechase across country differs in many respects from that described above, but primarily in the fact that it is held over country supposed to be open, and the obstacles encountered are natural and not artificial. The courses naturally vary in accordance with the country traversed, but care should be taken to make them as varied as possible; and to apply the term "cross-country" to some courses, mainly consisting of road, is a misnomer. In the cross-country steeplechase of the present day it is seldom that hedges or gates are cleared, though vaulting is an extremely useful accomplishment, and should be more cultivated than at present. Most runners get through a gap in a hedge or take a ditch very gingerly, whereas with a little more pluck and determination the obstacle could be negotiated much more quickly, and with less personal injury. Racing for a gap is quite legitimate, provided the holder does not willfully hang back with the object of impeding those behind.

SPORTS AND GAMES

Throwing the Disk

By G. S. ROBERTSON

THROWING the disk has had a precarious existence in Greece since classical times, but cannot be said to have been conformed to rule and formally introduced to the athletic world, until the Olympic Games of 1896. Its obvious elegance deserved a better fate.

The disk is circular, having a diameter of twenty-two centimeters (about eight and one-half inches), and is composed of wood surrounded by a rim of iron. A nucleus of lead is let into the center, bringing up the total weight to two kilogrammes (about four and one-half pounds).

The performer stands in a square of two meters and holds the disk in both hands above his left shoulder. The fingers of the right hand grip it tightly by the upper edge; those of the left merely support it. The left leg is advanced. Then the body is swung half round to the right, so that the face is turned toward the disk, the latter having been brought round by the right hand to a position above and behind the performer's head. At the same time, the right leg is put forward. It is this attitude which is depicted in the celebrated statue of the "Discobolos." The left leg is then brought swiftly to the front again, and the disk is hurled with all the swing of the body. The hand must at the moment of ejection be horizontal, so that the missile may traverse the air horizontally. The distance thrown at the Olympic Games was rather over ninety-five feet.

SPORTS AND GAMES

Throwing the Hammer

By G. S. ROBERTSON

THIS game has always suffered from diversity of rules. We need only concern ourselves with the A. A. A. and American codes, which compel the performer to throw from circles of nine and seven feet diameter respectively. The American circle has a raised rim to keep the thrower safely in. Under both sets of rules the hammer must weigh sixteen pounds, must have a total length of not more than four feet, a handle of metal or wood, and a head of any metal. The Inter-University circle of thirty feet will, it is to be hoped, soon vanish, and may therefore be dismissed, as may also the Scotch or stationary method, which is of very limited application. The performer stands generally with his back to the direction in which he wishes to throw, with the head of the hammer resting on the ground outside the ring beside him. He obtains the impetus required by whirling the hammer round above his head as many times as he deems necessary, keeping his feet quite stationary. When he has obtained sufficient swing, he brings his whole body round with a jump (some performers contrive to gyrate twice or even thrice within the circle, but this practice is not recommended), keeping his arms and the hammer as far outstretched as possible, and having thus arrived at the front edge of the ring, he discharges the missile. The cardinal points to be observed are, (1) keeping absolutely stationary while getting the swing on the hammer, (2) rapidity in jumping round (most important of all), and (3) continuous command over the weapon, so that it may be thrown with the whole force of the body, and not merely with the arms.

SPORTS AND GAMES

Tobogganing

By J. D. CHAMPLIN and A. E. BOSTWICK

COASTING on toboggans—sleds without runners—has very naturally been listed as tobogganing, and as an outdoor winter sport, in Canada particularly, is in high favor. Toboggans are made of tough elastic wood, from one-eighth to one-quarter of an inch thick, and vary in length from four to eight feet, and in breadth from sixteen to twenty-four inches. Across the top, ribs or cleats of wood are fastened, to give them strength, and along the sides are hand rails, to which the coasters may cling, and to which cushions are often strapped. The front is bent backward in a curve, to form a sort of dashboard. The slides on which toboggans are used are either natural or artificial. In this country the latter are most common. Natural slides are apt to be uneven, and contain little mounds, called in Canada *cahots*, which make the toboggan leap into the air and cause accidents. The artificial slides are frameworks of timber supporting a slideway of boards which is covered with snow and ice. The highest point may be forty or fifty feet above the ground. These slides are often built on the side of a hill, where part of the descent is natural. There are also double slides, consisting of two slides side by side, but with the incline in opposite directions, so that after descending one the coaster has only to ascend a flight of steps to be at the top of the other slide. At the top of the slide is a starting platform, and leading from this are chutes, or flat-bottomed troughs, in which the toboggan runs. There may be several of these, each from four to six feet wide, with raised side boards to keep the toboggan on the chute. Below the chutes is generally a natural slide with a very slight inclination, and sometimes hay is placed at the bottom, to stop the toboggans. On one side of the slides is a flight of steps, and by its side a dragway on which the toboggans are drawn up.

The chutes are packed with snow, or sometimes with a mixture of snow and sawdust mixed with water and allowed to freeze. If the packing is done properly, the surface should be perfectly smooth, and the toboggans will attain great speed—often as great as a mile a minute. The makers of one kind of toboggan have advertised that with their toboggan a speed of three miles per minute may be reached. Yet, on properly built slides, toboggans are safer than ordinary sleds, for they cannot leave the chute; and as they have no runners and are close to the ground, they rarely upset.

STEERING.—The toboggan is guided either by short sticks of wood in the hands, or with the foot. The right foot is generally used, and the steerer kneels or lies on his side. The principle is the same as that by which a sled is steered. By touching the ground with the bit of wood or the foot on one side, that side is made to go slower and the toboggan turns in that direction. A toboggan is easier to steer than a sled. On some slides steering with bits of wood is forbidden, as it tears up the surface.

The toboggans made in Canada are commonly of one piece of wood, with a smooth flat bottom. Toboggans are made in the United States of slats rounded on the bottom, so that each is a sort of low runner. Some toboggans are shod with steel. The rails at the sides are often made to yield to the motion of the toboggan, so that they bend easily. The screws that fasten them should not appear on the bottom, for if they project they increase the friction and tear the ice on the slide; and if they are sunk into the wood, the snow collects in the holes and roughens the bottom.

HISTORY OF TOBOGGANING

The word toboggan is a corruption of the Indian *odabaggan.* Toboggans were used by the northern Indians, before the discovery of this continent, for the transportation of game, furs, and other goods. They were drawn either by dogs or by men, and were well adapted for traveling on the deep snow. They were originally fastened together entirely with deer-thongs, but now metal rivets or screws are used.

During the French and Indian wars, and in the Revolution, toboggans were used for transporting military stores and equipments in northern campaigns. About 1835 British officers in Montreal introduced tobogganing as a sport by coasting down Mount Royal. The sport grew quickly in popularity, and the artificial slide, which had long been in use in Russia, was soon introduced. In this country, tobogganing was first practiced in northern New England near the Canadian boundary, but within a few years it has been popular in other regions. In 1884 a large slide was erected in Saratoga, New York; and since then others have been built in various parts of the United States. At the "winter carnivals" in St. Paul, Minnesota, Burlington, Vermont, and other cities—in imitation of the one held annually in Montreal, Canada—tobogganing is one of the favorite sports, and there are parades of the members of toboggan clubs, clad in gayly colored uniforms.

SPORTS AND GAMES

Weight Putting

By G. S. ROBERTSON

THE weight should weigh sixteen pounds, and in England must be of iron. It is put by A. A. A. rules out of a seven-foot square, in America from a seven-foot circle with a raised rim. Oxford and Cambridge use a ten-foot square. The put is measured in England along a perpendicular, from the pitch of the shot on the side, or side produced, of the square; consequently, crooked putting is as disadvantageous in England as it is advantageous in America.

Excellence in shot-putting, as in hammer-throwing, depends entirely on the capacity to bring the weight and strength of the body to bear upon the missile. To acquire this, the elbow of the arm which supports the shot should be kept directly below the hand, and the hand close to the shoulder, which it should not leave till the very instant of discharge. Further, the performer should stand sideways in respect of the front side of the square, keeping the right shoulder and the shot well back, and being careful to rest the whole weight of shot and body on the right leg. The left leg is raised and held in front to balance the body. A hop forward is taken in this position, the right shoulder being kept as far back as ever; then by a rapid twist of the whole body, the right side and leg are brought to the front, and the shot is propelled. This twist corresponds to the circular jump in hammer-throwing, and in both cases rapidity and the continuous application of all available strength and weight to the missile are of the highest importance.

SYSTEMATIC PHYSICAL TRAINING

Introduction

Chapter I—Our Physical Needs

THE peril of this century is physical decay. This peril is gravely imminent with respect to all who dwell in our great cities. All the conditions of life in the modern American city favor it. Our vastly developed commercial tendency is one of its most effective promoters. Wealth, or the accumulation of that wherewith to gratify the desires, is the great incentive of our contemporaneous life, and under its fevered stimulation, vast numbers of men and women, utterly careless of the body's needs or demands, struggle in the great conflict, and eventually go down, victims of the unchangeable law of Nature, which decrees that the fittest shall survive.

And all these weak persons, who succumb to the inevitable before they have reached the ultimate span of a normal life, bear or beget children who are weak in proportion as their parents were weak, and these, thrust in their turn among conditions demanding strength, resisting power, and vitality, succumb quicker than their forebears.

We are living in an age of rapid transit. The telegraph, the telephone, the swift-flying mail train and ocean liner have quickened the pulses of life and revolutionized the methods of doing business. How to keep pace with this rapid method of doing things is getting to be a very serious problem with a great many people. The difficulty of adapting one's self to new methods of thinking and acting is a very real one, and thousands of persons are breaking down annually in their efforts to do so. It would be the height of folly for a young man to enter an athletic contest at the present day without taking a course of preparatory training to get himself in condition. But the pursuit of a trade, business, or profession is no less a struggle, in which those who are best prepared and who keep themselves in the best working condition, both mentally and physically, win success, while those who are poorly prepared, through lack of a good inheritance or education, or who neglect to keep themselves in fine physical condition, drop out of the contest and give up the race. It must be apparent to every one that in order not only to attain eminence, but even to hold one's own in the struggles of the business world, a man must always be at his best.

How to keep one's self physically fit to meet the duties and responsibilities of everyday life is a vital matter, worthy of consideration by every individual.

There is a great natural truth, universally demonstrated with regard to the various forms of living organisms embraced in the animal life of the world; and that is, when all the functions of the body work together harmoniously, such as the digestion, the respiration, the circulation, and the excretion, there is found a normal, strong, healthy organism, capable of existing under conditions that would mean the quick dissolution of one in which there was a derangement of the natural functions.

The human body is a most intricate piece of machinery. It may be compared to a steam engine which requires fuel, water, and oxygen. It obtains heat by the burning of the fuel with oxygen; the waste products that result from the combustion take the form of carbonic acid gas, urea, etc.

To insure a continued, harmonious working of this machine, all the parts must be properly developed and adjusted, one to another, and there must be a constant supply of the fuel (food), water and oxygen.

This complex machine has the power of effecting repairs resulting from ordinary wear and tear, under proper conditions, so that with the proper treatment, the span of its existence might be indefinite.

Briefly, the digestive organs supply the blood with fuel, which is carried to the lungs and other parts of the body to be utilized as heat-producing elements, or to repair some broken-down part of the machinery. The oxygen necessary to completely burn, and employ this fuel, is taken into the lungs by respiration, or breathing. As the blood circulates through the body, laden with the various elements which constitute the tissues, bones, nerves, etc., of the body, the various living cells select what they need for maintaining their structure, and the residue, or waste, is passed out through the excretory channels as waste products.

But without exercise of our bodily functions they become deranged and weakened. The body without exercise is like a rusting engine, which finally drops to pieces from sheer disuse. Flabby muscles, shortness of breath, inability to undergo sudden or difficult exertion, and low vitality, are the certain symptoms of a body that is rusting.

With this plain, common-sense view of the structure and functions of the human body before us, it is apparent that the only thoroughly natural method of maintaining the equilibrium of health is to exercise—use the various organs reasonably—and to supply the proper proportions of food, water, and oxygen.

But the intellectual character of civilization has the tendency to develop the mental faculties of men and women at the expense of their physical strength. This is one of the evils of specialization, where an individual becomes a mental machine, quick and ready at his chosen work, but weak in all that goes to make physical manhood. From this one-sided development there can be nothing but ultimate failure.

The physical organization has been left out of the scheme of life altogether by many men and women, or else a too strong belief in the potency of drugs to remedy any manifestation of weakness has led them into the error of artificial stimulation of the overtaxed muscles and nerves, with disastrous results.

The day when there was absolute dependence in drugs has passed, and the advance guard of the new medical profession has for some time past recognized the fact, that not only physical development can be attained by exercises which employ the muscular system in regular movements, but that by bringing into systematic use the muscles and organs of any affected portion of the body, wonderful curative powers are put in operation.

There have been half a dozen treatises on the application of physical exercises to healing purposes written by members of the medical profession. But most of them were designed merely to supplement the ordinary treatment by drugs. We undertake to supply herewith a series of exercises, devised to gradually strengthen the entire physical body, and to do it so gradually that even an invalid may take up the system, and by following it through to its conclusion obtain not only relief from his disease, but the requisite degree of muscular strength which one of his or her particular height and build should possess.

Most of the systems of physical culture heretofore put before the public are arduous, and demand considerable time. The advantage we claim for the following exercises, which embrace all that is necessary to secure the development of an athlete, is that they requires absolutely no apparatus, although we give a few movements at the close for dumb-bells; and that all the time required is a few minutes every morning and night. You will never miss these short periods of exercise from your day's duties, and you will find yourself unconsciously gaining vigor and elasticity, and the buoyant spirit that is inseparable from successful achievement.

CHAPTER II—DIET

I referred in the preceding chapter to the importance of supplying the proper fuel to the intricate living engine—the human body. The importance of this subject becomes greater when we undertake to effect a development of the physical system to that degree of perfection that accompanies health. A person might exercise persistently, practicing the most approved movements, and still never succeed in developing a particle of muscular tissue, or gaining the normal level of health, if they refused to conform to a diet that would supply the elements of nutrition needed by the body to maintain its heat and effect its repairs.

A great many persons who have made a study of the relation of strength and endurance to food, have arrived at the conclusion that a vegetarian diet is the best for quick, permanent, and vigorous development. I, however, have been able to secure good results where a mixed meat and vegetable diet was employed, provided I could secure the desired rotation of foods.

It is a well-known fact that a majority of people continually over-eat. If they do not over-eat in quantity, they do it by consuming such foods that an over-supply of some element of nutrition is obtained at the expense of some other very necessary element.

The ideal diet would be one that combines the exact quantity and proportion of elements that the body consumes in the course of a day. It is comparatively easy for the scientist, equipped with all the apparatus at his command, to determine the elements needed, and their exact proportions. The elements required in the daily ration of a normal healthy man consist of nitrogenous, or tissue-building foods, to give the elements needed to effect repairs in the tissue structure; fats, which are heat-producing, starch and sugar, also heat-producers of a lower grade, and a small percentage of water and vegetable salts.

All these four elements are contained in vegetables, and in approximately the proportions needed by the body. Meat is a tissue building food, and where a mixed diet is preferred, this should be borne in mind, and the necessity for eating a sufficient quantity of vegetables or fruits be not overlooked.

I shall not enter into any extensive discussion of foods here, but I devote sufficient space to give the student a proper idea of the foods he should eat, and how they should be eaten.

For one of average health who undertakes this system of exercise for better physical development, the following regimen of diet should suffice:

At the first meal, eat only fruit, cereals, and milk. This should be thoroughly masticated, and not gulped down without being mixed with a sufficient quantity of saliva to start digestion immediately.

When convenient, the principal meal should be taken about noon, when the activity of physical organization is at its height, and the body is expending more energy and needing more heat producing and repair materials than at any other time. This meal should be confined to one dish of good, well-cooked meat; beef or mutton preferably; whole wheat, or some whole grain, bread, butter, a few potatoes, rice or other starchy vegetable, and all the watery, saline vegetables, such as spinach, cabbage, turnips, lettuce, celery, cresses, etc., that the appetite craves. For dessert, rice or tapioca pudding or fruit is the best.

Plenty of time should be taken at this meal, and every morsel thoroughly masticated. Nine-tenths of the stomach disorders arise from swallowing food improperly masticated; and all the physical exercises you can take will not make up what you lose in omitting to exercise the muscles of your jaws sufficiently at meals.

If I were called upon to point out the most important exercise that a man or woman could take, I would unhesitatingly say, exercising the muscles of the jaws at meal time. This thorough mastication not only desiccates the food, and turns it into the stomach in a condition that permits the speedy action of the digestive fluids upon it, but it constantly sends out into the mass of food tiny jets of saliva, which is one of the most important juices in the digestive apparatus, and without a sufficient quantity of which complete digestion is utterly impossible.

The last meal should be eaten several hours before retiring; and when the principal meal is eaten at noon, it should not include any meat. Bread, cheese, vegetables of all kinds, and stewed fruits, should be the principal ingredients.

It is of the utmost importance, where one desires the quickest and best muscular development, to omit coffee, tea, and stimulants from the dietary, and to avoid pastries, highly seasoned and spiced dishes. In the place of coffee or tea as a beverage, substitute either cocoa or a mixture of hot water, milk, and sugar.

There is a mistaken idea that meat is the only strengthening food. On the contrary, if you want to develop good, firm, elastic muscles, and put the organs of your body in a healthy condition, do not eat much meat. Confine your meat eating to one meal, as suggested in the foregoing schedule, and absolutely and resolutely refrain from anything between meals. Eat as little of sweets as it is possible to get along with. Do not eat candy at all, and what fruit and nuts you eat, make a part of one, or all, of your meals, and eat them as necessary food, not for the sake of stimulating the nerves of your palate.

Three meals a day are sufficient for any one, even a man doing heavy physical labor in the open air; and if your occupation is indoors and largely sedentary, two will be found sufficient.

Let your meals be regular, and vary the vegetable portion of your diet as much as you can. With the great variety of vegetables, fruits, and nuts always in our markets, this is not only easy, but it can be done economically.

Where it is desired to go without meat, it can be easily done, and perfect nutrition maintained, by merely substituting such food as eggs, cheese, beans, peas, or lentils in its place. Peanut butter and whole wheat bread also form a combination that, quantity for quantity, give more nutritive qualities than can be obtained from the richest meats.

The drinking of water is a very important part of the hygienic care of the body. Most persons do not realize the important part played by this fluid in the mechanism of the body, and constantly neglect to take a sufficient quantity of it. Drinking at meals should be avoided, as a little practice at proper mastication will demonstrate that no fluid is required as a part of the meal. Water at about the temperature it comes from the earth should be drunk freely, however, immediately after rising in the morning, and at intervals between the meals. Where the desire for it has been denied until the habit of going without it is fixed, a glass should be taken at regular intervals every day. Those who will adopt this method will be surprised at the beneficial effects that will follow.

Under ordinary conditions waste matter accumulates daily in the alimentary tract, and that part of one's body needs cleansing with water just as much as the outer skin.

CHAPTER III—THE WAY TO GAIN STRENGTH

It would be well for us to consider at this point the various kinds of physical or muscular development it is possible to attain by systematic exercise.

All my readers have, possibly, at some time or another, seen one of those extraordinarily developed individuals, with bunches of so-called muscles that seem to be stretching their covering of skin almost to the bursting point.

I want to caution you against this type. Such muscular development is to be shunned just as one shuns a disease. It is the affliction of men who have overtrained, and who have strained their muscles to the limit of their endurance continually for a long period of time. They have succeeded in making them large, but they lack life, resiliency, and spring.

I may compare the healthy muscle to a steel spring. The latter has a point beyond which, if bent, it will not resume its original shape; and a muscle, tired beyond its normal point of resistance, will become hidebound or stiffened. It cannot bear the strain, or respond like the long, smooth, normal muscle.

Another form of development is likewise to be avoided. It is the bunchy type of muscular development. You have seen it in the arms of sailors, for instance, whose work has been mostly hauling halyards; in professional strong men, who give weight-lifting exhibitions, and have enormous arms and shoulders, sometimes with very little lung power, and with poor, malformed legs.

The bunchy muscle is only partially developed. When contracted it stands out prominently, and looks enormous, because only a part of the muscle has been developed, and the lack of development of the remainder robs it of its symmetry.

In both of the forms of development mentioned above, the underlying veins and arteries are liable to be much enlarged, and therefore are sure breeding grounds for disease.

The ideal muscle is the one that combines the greatest strength with the greatest suppleness. It should contain the largest possible number of sound muscular fibers, without any attendant malformation of the inclosed vessels. Ideal muscular development, moreover, should extend throughout the entire body; embracing not only strong external muscular tissues, but sound, strong heart, lungs, and internal organs, and should be accompanied by a harmonious working of those organs.

Good digestion, restful sleep, and a pink skin are the best indications of such a condition. To the untutored eye, one who possesses the ideal development may not appear to be so powerful as either of the two false types I have mentioned, but place individuals representing each type in a position requiring endurance, or a manifestaton of general bodily strength, and the ideal development will triumph in every instance, provided, of course, that the individuals are of similar height and weight.

For the acquisition of this form of development the greatest care is necessary. The body must not only be supplied with proper food, as stated in the preceding chapter, but care must be taken to begin the exercise in such a manner that there is an even development throughout the entire muscular system; and to have the muscles, during exercise, in the most favorable condition. There must always be a full supply of blood to the muscle in use, and, to obtain this, attention must be constantly directed to full, deep inhalations of pure air.

I have stated before that proper care in masticating food should be used freely by those who would secure a good, sound physique. It is not less important that the lungs be regularly and thoroughly employed. The purification of the blood—the burning out of the dead, waste matter in it by contact with oxygen—occurs in the lungs, and in order to furnish the proper kind of blood to your muscles, you must thoroughly oxidize it in the lungs. Bear this in mind, later, when you come to the exercises, and acquire the habit of proper breathing as quickly as you can.

Muscular development should be undertaken with a view to secure quickness of response, or suppleness, as well as to acquire resisting power. To do this the amount of resistance imposed upon the various muscles must be carefully graded. Any muscle, or set of muscles, subjected to a weight, or resisting force, greater than the energy of the muscle can sustain, becomes strained and weakened.

This system of exercises was designed with the special object in view of leading the student, by easy stages, into a condition of ideal development, in which all parts of the body are harmoniously strengthened. Therefore this word of caution is needed here. Take up the exercises as they are given; practice each series for the time allotted to it, following instructions faithfully, and you will acquire the development desired in a much shorter time than if you performed the movements haphazard, and without reference to the gradual strengthening of the muscles employed.

If you have ever performed any unusual physical work, such as taking a long bicycle ride after months of idleness, or attempted an unusually long walk, you are aware of some of the effects that may be expected from subjecting weak, undeveloped muscles to too great a strain. The soreness and lack of tone that generally follow such an experiment prevent one from repeating the effort for some time.

So, in exercising, if you do not adopt a gradual, systematic form of development, there are likely to be disastrous results. Too much exercise, as we have seen, will result in staleness, or a muscle-bound condition. Exercise of a violent nature, performed by one with untrained muscles, will result in a loss of tone, the rupture of a muscle, rupture of a blood vessel, dilatation of the heart or an artery, the giving way of a weakened valve of the heart, and divers other untoward manifestations.

These exercises were designed with the special object of supplying healthful and harmless exercises, which may be taken with benefit by the weak, as well as by the healthy. There is no danger, even in a patient suffering from heart disease, for instance, taking this system of exercises, if he will follow the instructions carefully, and depend on constant repetition for the development he desires to effect, instead of attempting to apply the entire system to his case at once.

Regularity and moderation are the mainsprings of success in striving for ideal physical development, just as they are in eating and the other pursuits of life.

In fact, regularity must be the watchword of every one who would secure the much to be desired blessings of sound health, a symmetrical body, and mental and physical vigor.

CHAPTER IV—BATHING

One of the most important of the excretory organs is the skin. In a previous chapter I referred to a clear, ruddy skin as being one of the best indices to a strong, healthy physical condition, which is invariably accompanied by pure blood.

Likewise the skin is also one of the most easily affected parts of the body in the case of disease. A number of obscure and troublesome diseases are confined exclusively to the skin. We all know how quickly the skin registers the existence of a deranged physical condition. In cases of indigestion, imperfect nutrition, poor circulation, and many nervous disorders the skin becomes pallid, cold, and clammy; and in all fevers the skin is hot, dry, and rough.

The fact that it plays such an important part, and is such a clear barometer of one's physical condition, should argue for the most minute care of that part of the body.

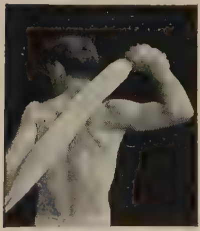
One of the first essentials for a healthy condition of the system, is a clean, healthy skin. To secure this, regular bathing is required. Through the pores—the tiny excretory ducts which arise in the subcutaneous tissues, and open at the surface of the skin—there is a constant excretion, in health and sickness, and unless this is removed, and the pores kept open, the results are bound to be disastrous. One of the most important phases of exercise is that by muscular movements. During exercises of this kind the skin is contracted and expanded, just as the deeper muscular tissues are, and the pores are made to discharge, in the form of perspiration, all the waste material that may, in the course of the bodily economy, have come into their territory.

Bathing, like eating, sleeping, and exercise, should be regular, and it should be performed as intelligently as any other important function of civilized life. No one can keep the skin in a healthy condition by an occasional bath, at intervals of a week. The skin demands daily care. The time spent in regular care of the skin will be amply repaid by the feeling of buoyancy, and the freedom from nervousness, and the effects of external conditions of temperature that are the results of proper bathing.

I would recommend to those who take up this course of physical development a hot bath, with plenty of soap, at least once a week, taken with a view to removing all the accumulations of perspiration, dead tissue cells, as well as the dust, etc., that one invariably accumulates upon the skin. In addition to these hot baths, there should be cold sponge or towel baths once or twice a day after exercising. Soap should not be used with these cold baths oftener than once or twice a week.

The cuts herewith show one of the most effective methods of stimulating the surface of the skin, and it should be made a part of every exercise. It is known as the friction bath, and should be taken immediately after going through the particular set of exercises you may be practicing, both morning and evening. A coarse Turkish towel is recommended, but a flesh brush may be used by those who prefer it.

Grasp the towel, as indicated in the cut, with hands far enough apart to give the arms room to swing, and then rub briskly, back and forward, over every part of the body, and continue till the entire skin is pink from the accelerated circulation.



Bathing—Fig 1.

It will usually take two or three minutes to accomplish this, and these two or three minutes, if the movements are made rapidly, and regular and deep inhalations are practiced, will suffice to give the body a ruddy, healthy glow.

Then wash briskly with cold water and sponge the entire body.

Directions for Friction Bath

Bathing—Fig. 2.

Stand erect, with feet together; grasp towel near each end, firmly; begin at back of neck, and with forward and backward passes of towel, work downward to waist, rubbing back, sides, and chest.

Then begin at the ankles, and work upward on each limb, as in cut No. 2. Finish on the arms, rubbing them briskly from the wrist toward the shoulders, and immediately sponge off thoroughly with cold water.

CHAPTER V—BREATHING

The conditions of modern life, especially those surrounding the man or woman of sedentary habits, are such as to make very little demand upon the individual for great lung capacity. The neglect of this function has brought the usual and inevitable decadence. There are but few people of normal lung capacity; and those with breathing power sufficient to enable them to run a hundred yards without being completely exhausted are exceedingly scarce.

One who has never studied the scientific development of the body would be surprised at the results of a few simple breathing exercises practiced daily. They will result, in the course of a very short time, in rounding out the flattened chest, giving greater lung capacity, and endowing the individual with an amount of endurance that he never dreamed of possessing.

Breathing is purely a muscular act. Proper breathing consists in thoroughly inflating every cavity of lung tissue by sufficiently enlarging the cavity of the thorax, to give the lungs room to expand. The upper part of the body, strengthened and surrounded by bony structure, can expand but little, therefore the normal breathing is done by exercising the muscles of the sides and diaphragm. This results in lifting the chest and naturally pushing out the ribs, and stretching the connecting tissues.

Breathing exercises should be of two kinds: those taken when you are going through your regular exercises, and which should continue throughout the exercise; and those taken while you are walking, which should be practiced every time you get a chance, until you have acquired a habit of deep, proper breathing.

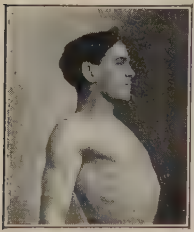
As the quickest way to accomplish this, begin each of your exercises with the following special breathing exercises:

First Breathing Exercise

Stand with the heels together; slowly inhale through the nose all the air you can hold in the lungs, with arms at side; then lift first one arm slowly, striving to inhale more air as the arm is lifted. Then raise the other arm, trying again to fill the lungs more completely; then let both arms drop at the sides, and exhale quickly through the open mouth. Repeat the exercise six to eight times. When taking up the other movements, continue to draw in as deep, regular breaths as possible while going through them.

Second Breathing Exercise

Stand near an open window, not in a draft, shoulders thrown back, head erect; then inhale slowly, to the full capacity of the lungs (Fig. 1). When the lungs are completely filled, open the mouth and expel all the air that you can by contracting muscles at waist and sides.



Breathing—Fig. 1.

Repeat this eight to ten times the first week, and increase two or three breaths a week, until you are taking thirty to forty at each exercise.

This should invariably precede both morning and evening exercises.

Moreover, one must not conclude that attention to breathing can end with the few moments devoted to systematic exercises every morning and evening. The individual who would gain strength rapidly will continue the breathing exercises at intervals during the day, and gradually accustom himself to a habit of proper breathing. This is only arrived at when one has learned not only the proper method, but has so schooled the various muscles employed in breathing that they perform their functions involuntarily.

Walking—Fig. 1.

To attain this object, one should cultivate a correct habit of walking and carrying the body.

Always walk with head erect and shoulders thrown back. Then as you start off inhale, through the nose, all the air the lungs will hold, breathing abdominally or diaphragmatically. When the lungs have thus been filled to their utmost capacity, retain the air while you take a stride, and then exhale quickly, emptying the lungs as completely as possible (Fig. 1).

At the start never attempt to forcibly expand the chest. Simply breathe naturally. When you have acquired the habit of taking full, deep breaths, and have practiced the exercises given in subsequent lessons, you will find that your chest will expand naturally.

General Directions

1. These exercises should be taken twice each day.
2. The best time to exercise is immediately after rising, and just before retiring.
3. Clothing prevents the free movements of the body, and also hinders the excretory function of the skin, consequently have as little clothing on when you exercise as possible. The best way for the healthy to exercise is nude.
4. The exercises should be taken in a room thoroughly ventilated, by open window, but avoid drafts during first week of your practice.

5. Immediately after exercising, take cool (not cold) sponge bath. It is important that the bath should immediately follow exercise, as it cleanses body of matter forced out of pores by the movements.
6. Rub body dry, briskly with rough towel, from head to foot, till skin is pink.
7. In the instructions that follow, we will frequently allude to "rigid" or "flexed" muscles. You should learn how to produce this condition at once. The muscles of the hands, wrists, and arms are made rigid by clinching hands and throwing your will into movement, as if you were lifting or pushing a heavy weight. The muscles of legs and body may be "flexed" or made rigid by assuming attitude you would in supporting a weight, and holding it. Keep this in mind when exercising, as results largely depend on the will power you put into your exercises.
8. Interest may be kept alive in the exercises by practicing before a mirror; you will also learn how to make the movements accurately.
9. These exercises should be taken regularly and strictly according to directions. Do not miss a single day. Half-hearted, spasmodic work will not bring the results you desire.
10. You should get in the habit of flexing your muscles—i.e., making them rigid—at intervals during the day. You will find great benefit, for instance, from stretching or "flexing" the muscular system, just as you have seen a dog or cat do, during leisure moments, in your office, or when you change from sitting to standing position. Attention to this will make the muscles firm quickly without much apparent effort on your part.
11. If muscles become sore after two or three days' exercise, don't become alarmed. Continue the movements, but do not attempt to make the muscles very rigid for a day or two, till soreness disappears.
12. Allow five or ten seconds to elapse between exercises, and during this interval allow muscles to thoroughly relax.

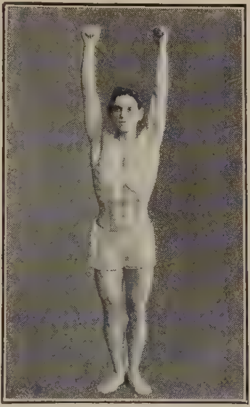
SYSTEMATIC PHYSICAL TRAINING

Exercises without Apparatus

FIRST LESSON

Exercise 1

STAND erect, arms extended as far as possible above the head, hands tightly clenched. Hold the body rigid, and the head firmly braced (Fig. 1).



Lesson I—Fig. 1.

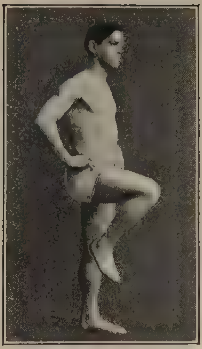
Bend the arms at elbows, keeping muscles as firmly flexed as possible, and drop hands towards shoulders, turning hands downward firmly at the wrist. Continue the downward movement till the thumbs touch the shoulder, then thrust the arms straight upward to the starting position, straightening the wrist as you make the upward movement. Make this movement as if you were striking at something slightly out of your reach.

Begin with twelve movements, and increase to sixteen second week.

This exercise will develop the muscles of the forearm, biceps, triceps and shoulder muscles, and stimulate the circulation of the upper part of the body.

Exercise 2

Stand erect, with heels together, hands tightly pressed against hips, shoulders back. Without allowing the body to sway from side to side, raise the right foot as high as it can be



Lesson I—Fig. 2.

lifted, keeping it always close to the other leg (Fig. 2). Then return it quickly to the floor, and lift the other foot in a similar manner. Continue this movement as briskly as you can, using alternately the right and left legs.

Commence with fifteen movements of each leg, and increase to twenty-five second week.

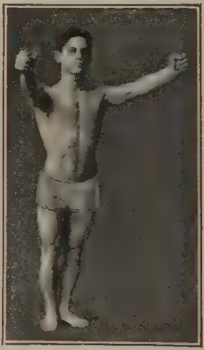
This movement will develop the muscles of the calves and thighs, and promote the circulation through the lower extremities.

Exercise 3

Stand erect, heels together, arms extended straight in front of you and parallel, wrists turned inward, hands firmly clinched (Fig. 3).

Swing arms outward and backward, in arc of circle, endeavoring to make the hands come as near meeting behind your back as possible. When the movement backward has been carried as far as you can make it, without straining, bring the arms quickly to the starting position.

Begin with eight to ten movements and increase to twenty second week.



Lesson I—Fig. 3.

Exercise 4

Assume same position as in Exercise 3; then, flexing muscles of arm firmly, and allowing the elbows to bend outward, and bending the hands inward at the wrist, bring the clenched hands together against the chest, backs touching. Thrust arms straight out to starting position vigorously.

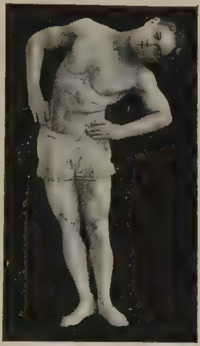
Begin with ten movements at each exercise and increase to twenty second week.

These exercises will develop the pectoral and other muscles of the chest, and increase the chest expansion and breathing capacity.

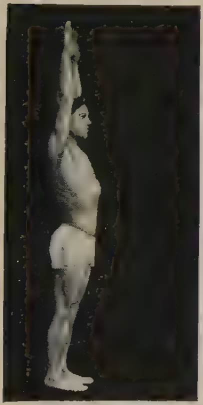
Exercise 5

Stand erect, heels together, hands placed firmly against the thighs; hold the legs rigid and perpendicular; then bend the body at the waist, alternately to right and left, as far as possible without losing balance. Make this movement slowly and deliberately, practicing deep and regular breathing (Fig. 4).

Begin with twenty movements and increase ten second week.

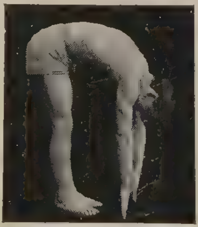

Lesson I—Fig. 4.

This exercise will give elasticity to the diaphragm, strengthen the muscular walls of the abdomen, stimulate the circulation and kidneys, and develop the supporting muscles of the lower half of the spinal column. Suppleness and a more graceful carriage will also be secured.


Lesson I—Fig. 5.

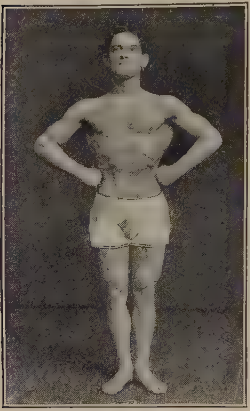
Exercise 6

Stand erect, heels together, hands extended straight over head, palms turned to the front (Fig. 5). Bend at the waist, keeping knees rigid, and sweep downward with extended arms, until fingers point to the floor (Fig. 6). Try every time you make this movement to touch the floor, then return to starting position, holding arms straight, and sweeping outward and upward with the hands. Perform the movements quickly.


Lesson I—Fig. 6.

Begin with twenty-five movements and increase to thirty-five the second week.

This exercise will greatly promote suppleness, strengthen the muscles of the back and sides, and tone up the action of bowels and kidneys.



Lesson I—Fig. 7.

Exercise 7

Stand erect, hands clenched and resting on the hips; breathe slowly and regularly; hold the legs and body rigid, and turn, at the waist, as if on a pivot, slowly and deliberately, from side to side as far as possible (Fig. 7). In making this movement hold the abdomen in. Continue until you are slightly tired.

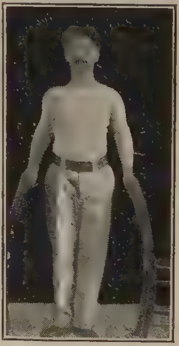
This movement is to aid in gaining control of the abdominal muscles, and to stimulate the internal organs.

SECOND LESSON

After you have devoted two weeks to the first lesson, the second lesson may be taken up. Go through the movements of the first lesson every day, morning and evening, repeating each exercise eight to ten times, and follow with the exercises included in this lesson. If you are regular in your exercising, and do not omit them, you should begin to see considerable improvement in your muscular condition by the time you have concluded the two weeks allotted to this lesson. Increase the number of movements three to five the second week.

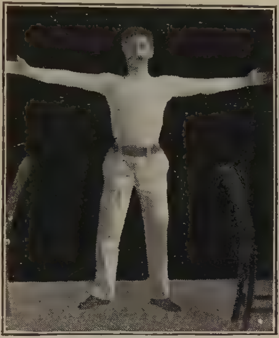
Exercise 1

Stand between two chairs which you have placed back to back about thirty inches apart (Fig. 1). From this position bend the knees and the arms, allowing the body



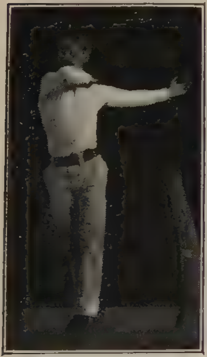
Lesson II—Fig. 1.

to sink between the chairs to a depth of about twelve inches; then extend both arms and legs energetically, bringing the body to an upright position. Be sure to keep the head and shoulders well back, and to lessen the resistance put upon the muscles of the arms and chest by doing the greater part of the work with the legs. In no wise is it advisable to try to lift the weight of the body between the chairs by the use of the arms alone. Repeat twenty times. This exercise will rapidly develop the muscles of the arms.


Lesson II—Fig. 2.

Exercise 2

Stand with the feet about twelve inches apart, with the arms extended outward from the sides in a horizontal position (Fig. 2). From this position turn as far round as possible to the left, keeping the left arm fully extended, but allowing the right arm to fold across the chest until the fingers touch the left shoulder (Fig. 3); now reverse the movement, turning quickly to the right, swinging the right arm well back in a horizontal plane, and allowing the left arm to fold across the chest until the fingers touch the right shoulder.

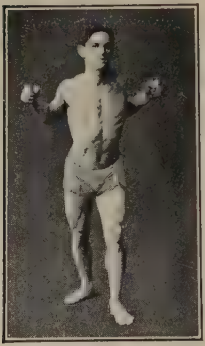

Lesson II—Fig. 3.

In doing this exercise concentrate the attention about the muscles of the waist and loins, but use the arms and legs in swaying from side to side in such a way as to modify or intensify the strain put upon the center of the body. Repeat twenty to thirty times in each direction.

Lesson II—Fig. 4.

Exercise 3

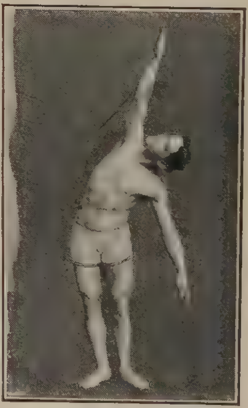
Stand as in Figure 4, arms extended, heels together, muscles rigid, hands clenched and palms to the front; then step forward with left leg, twenty-eight to thirty inches, bending left knee, and bringing clenched hands inward until thumbs touch the chest; body slightly bent backward at waist when in position of Figure 5. From this postion return to that of Figure 4, extending arms to full length, and straightening body to full height, holding muscles rigid. Make ten movements, and then put the right leg forward and make ten additional movements.



Lesson II—Fig. 5.

Exercise 4

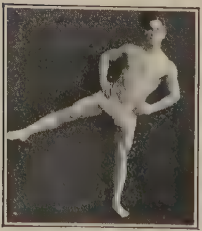
Stand erect with arms extended, fingers straight; then, holding arms as nearly in a straight line as possible, and the muscles of legs and arms rigid, bend at waist till one hand points straight to the floor, and the other straight to the ceiling (Fig. 6); straighten body and bend in opposite direction till the position of the arms is reversed. These movements should be made quickly. Repeat fifteen to twenty times.



Lesson II—Fig. 6.

Exercise 5

Stand with heels together, hands placed firmly against the body at the waist; then lift right leg, sideways, as high as possible, straightening the foot as the leg is lifted, and swaying the body slightly in



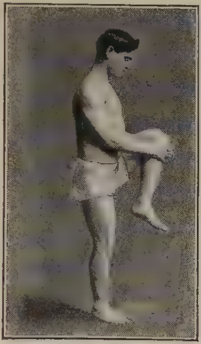
Lesson II—Fig. 7.

opposite direction; return leg to starting position, and then thrust out left leg in similar manner (Fig. 7). Repeat the exercise ten times with each leg.

THIRD LESSON

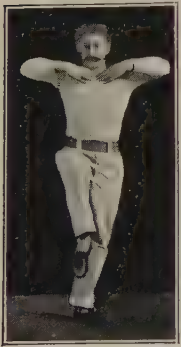
Repeat each of the exercises given in the preceding two lessons ten times, and at their conclusion add the exercises given in this chapter. It will be found of great benefit in developing the muscles of the hands, arms, and shoulders to practice the following exercise several times during the day when opportunity offers.

Clasp the hands behind the back, straighten the arms, and press them inward against the sides as firmly as possible, inhaling a full breath in the meantime, exhaling it as you relax from the movement. Clasp hands in front of the chest, elbows bent till the forearms are in a straight line in front of the body, and then try to pull hands apart, using all the force, both in grip and pulling, that you can.


Lesson III—Fig. 1.

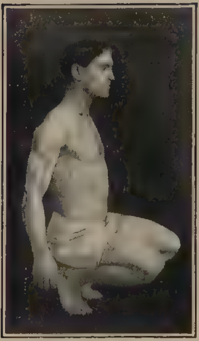
Exercise 1

Stand erect, then, inclining body slightly forward and lifting one leg, clasp hands over knee, straighten the body, and pull thigh as firmly against the lower part of the abdomen as possible (Fig. 1). Relax, and repeat movement with other leg. Repeat ten times with each leg.


Lesson III—Fig. 2.

Exercise 2

Stand in a natural position with the elbows at the sides and finger points touching, just under the chin. Raise the elbows out from the sides as high as possible, keeping the fingers of both hands in contact under the chin, and elevate the right knee to

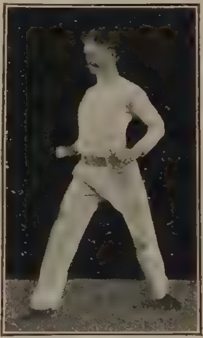


Lesson III—Fig. 3.

a horizontal position in front of the body, as in illustration (Fig. 2). Return to the original standing position with the elbows at the sides and raise the elbows and left knee; repeat alternately with right and left leg elevated twenty times.

Exercise 3

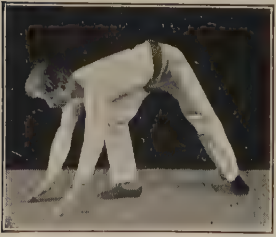
Stand erect in a natural position, arms at sides, body held perpendicular, and chest out; then, bending both knees, let the body sink downward, rising slightly on the toes, till you have assumed as nearly as you can the position of the figure in the illustration (Fig. 3), returning to erect position without moving the feet on the floor. Repeat twenty to thirty times.



Lesson III—Fig. 4.

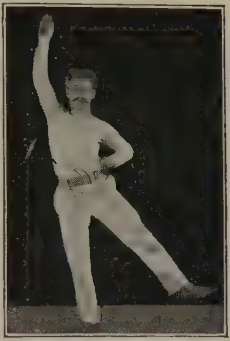
Exercise 4

Stand with the right leg advanced diagonally forward about thirty inches, and the hands held clenched about the height of the hips (Fig. 4). From this position swing the body forward, pivoting at the hips and throwing the weight well on to the right leg. Extend the arms downward till the fingers touch the floor just beyond the right foot (Fig. 5). Bring the body to an upright position, pulling the arms upward and backward until the hands are again on a level with the hips. The movement is a little like that employed in rowing a boat, and the action may be greatly intensified by leaning well back at the end of each stroke, so that the body is on a line with the advanced leg, and the weight is shifted from



Lesson III—Fig. 5.

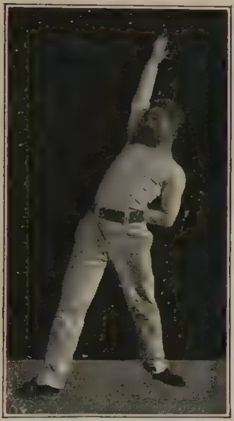
the right to the left foot. Repeat fifteen to twenty times, then place the left leg in position and go through the movement a like number of times.



Lesson III—Fig. 6.

Exercise 5

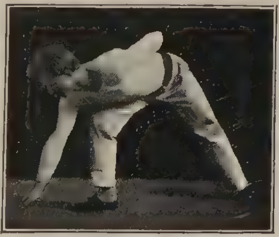
Stand with the feet together in a natural position, with the left hand on the hip and the right arm by the side. Raise the right arm upward and sideways to an extended position above the head; at the same time raise the left leg outward and sideways as far as possible, being careful to keep the moving arm and leg rigidly straight (Fig. 6). Repeat fifteen times, and then make same number of movements with the left arm and leg.



Lesson III—Fig 7.

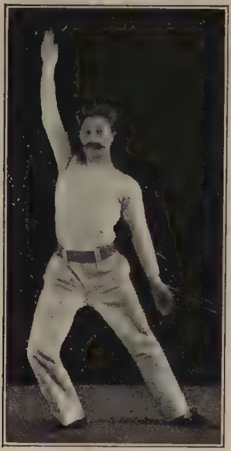
Exercise 6

Stand with the right foot advanced diagonally about thirty inches, with the left arm folded across the small of the back, and the right arm extended upward over the head as far as possible (Fig. 7). From this position incline forward, pivoting on the hips, and touch the floor in front of the right foot with the fingers of the right hand (Fig. 8). Return again to the original position, keeping the right arm rigidly extended and carry it backward as far as possible. Repeat ten times, and then make ten movements with the left foot advanced and the right arm behind the back.



Lesson III—Fig. 8.

FOURTH LESSON

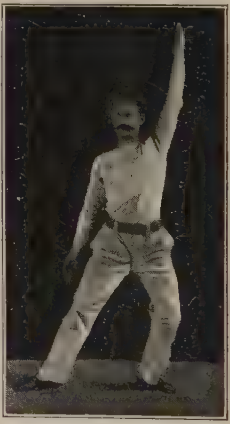


Lesson IV—Fig. 1.

If you have faithfully followed the directions given in the preceding lessons, omitting none of the exercises, you will have greatly stimulated your muscular system by the time you have completed the two weeks allotted to the last exercises, with the movements continued from other lessons. We can now proceed to exercises requiring considerable endurance, and calculated to harden the muscles rapidly. From this point onward we shall conduct you through movements that will produce athletic muscles. If you have not sufficiently strengthened your muscles by the preceding exercises, to take these without producing soreness, or undue strain, merely attempt them, and practice the movements of the preceding lessons which bring into play the muscles which show undue weakness. In a very little time you will be able to do the most difficult exercises, and your muscles, while not as hard as wood, will be as hard as a healthy, normal muscle should be. Moreover, they will be evenly developed. Continue the exercises of Lessons Two and Three, beginning each exercise with the movements given in this lesson.

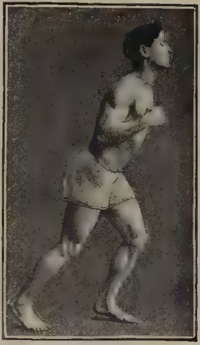
Exercise 1

Stand with the feet about twenty inches apart, with the weight thrown on the right leg, and the right arm extended upward, and the left arm down by the left side (Fig. 1). From this position bring the left arm sideways and upward, and carry the right arm sideways and downward, throwing the



Lesson IV—Fig. 2.

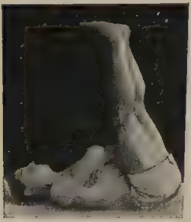
weight of the body at the same time on the left foot (Fig. 2). Continue the exercise, throwing the weight of the body first on one leg and then on the other, bending the right knee and swaying the hips to the right and the shoulders to the left as the right arm swings upward and the left arm downward, and reversing the action of the hips, legs, and shoulders as the left arm swings upward and the right arm downward. Repeat twenty-five times.


Lesson IV—Fig. 3.

Exercise 2

Stand as in illustration (Fig. 3); hands tightly clinched and held against chest; strike out, as if at an object, with left hand, holding right fist against chest, throwing body slightly forward, bending left knee, and bringing left foot firmly on the floor, and at the same straightening the right leg and raising the heel of right foot. Bring the left arm back to starting position, throwing the body backward from the waist up, striking straight in front of the body with the right hand, dropping the weight of body on the right leg, bringing the right foot firmly on the floor and raising the heel of the left foot until the top of the foot nearly forms a straight line with the leg. Make the movement ten times and then change position of the legs, bringing right in front; and repeat ten times.

Exercise 3


Lesson IV—Fig. 4.

Lie at length on back, arms folded on the chest; bring the legs up slowly and steadily, without bending the knees, until they are perpendicular, then press them forward towards the head as far as possible, and return to starting position (Fig. 4). Breathe regularly while making this movement. By bringing the feet as far forward as possible, and slightly raising the buttocks each time, the best results may be obtained. Repeat eight to ten times.

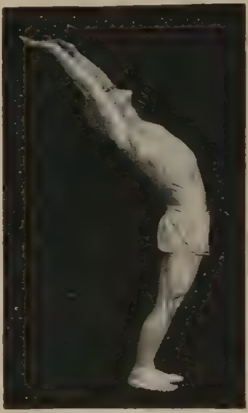
Lesson IV—Fig. 5.

Exercise 4

Lie at length, arms folded on chest, muscles rigid, then, without lifting the feet, rise slowly to sitting position, returning from this position to the reclining one (Fig. 5). Repeat ten times.

Exercise 5

Stand erect, arms extended straight over the head, palms forward, then bend body at waist, bring arms downward until the fingers point to the floor, holding knees rigid; then straighten the body, throwing arms over the head and as far backward as you can, as in the illustration (Fig. 6). Repeat ten to fifteen times.



Lesson IV—Fig. 6.

FIFTH LESSON

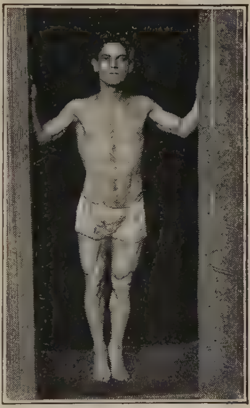
The object of the preceding lessons has been quite as much to train the muscles to uses other than what they have been subjected to in the ordinary course of your daily life, as to promote development. The splendid development you see in the athlete was obtained by work, and if you aspire to a fine athletic physique you must work to obtain it. The exercises in the succeeding lessons, therefore, will be such as require actual muscular exertion. If you have prepared for them by faithfully going through the preceding lessons, you will be in a condition that will enable you to go through the exercises with comparative ease.

These exercises will give you all the "heavy" work needed to perfect your development, without recourse to any form of apparatus, and without entailing the risk of injury from strain.

During the first week of your practice of the following exercises, do them only at night, following the exercises of the preceding lessons; then add them to the morning exercises also, if you have the time. If your time is limited in the morning, you may take them at night only, dropping the exercises included in the first two lessons, and devoting a little more time to these exercises.

Exercise 1

Stand in an open doorway, the feet together, a few inches back from the sill, grasp the sides of the door firmly, at about the height of the chin, press upward with the arms, as if trying to lift a weight over your head; hold this pressure at as great a tension as you can and rise on the toes (Fig. 1). Return the heels to the floor, and repeat the movement until the muscles are slightly tired.

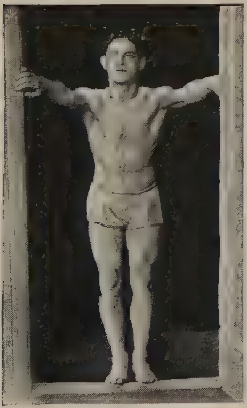


Lesson V—Fig. 1.

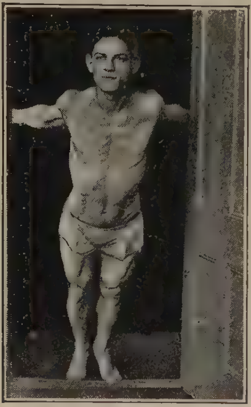
Exercise 2

Stand with the toes on the door sill, hands grasping sides of door (as in Fig. 2) on a level with the chin, bend the body at waist, letting it drop downward slightly, and push backward with legs, making the arms support a part of the weight of the body, as well as resist the push of the legs; then bring the body to a straight line, inclined at such an angle backward that the arms will be straight, and throw the head as far backward between the shoulders as it will go.

From this position return to the first, and repeat until muscles are tired.



Lesson V—Fig. 2.



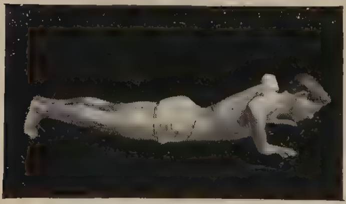
Lesson V—Fig. 3.

Exercise 3

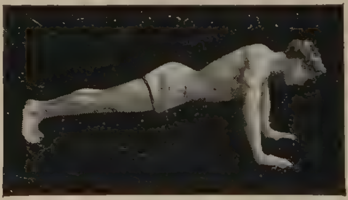
Stand with toes just touching the door sill, as in illustration, hands grasping sides of door at level of the shoulders. Throw the body forward as far as possible, rising on the toes and bending the back inward at the loins (Fig. 3). Return to the starting position, and continue until tired.

Exercise 4

Assume the position of the figure in the illustration (Fig. 4) with the body rigid, toes and hands only touching the floor; then straighten the arms, lifting the upper part of the body until you are in the position shown in Figure 5. Allow the arms to bend, and lower the body until it is at the starting position, without letting any part of it, except the hands and toes, touch the floor. Repeat the movement eight to fifteen times, or until you become tired.



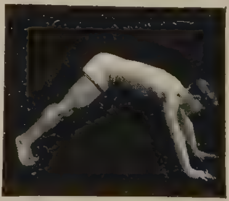
Lesson V—Fig. 4.



Lesson V—Fig. 5.

Exercise 5

Support the weight of body, extended at full length, on hands and toes, arms straight and rigid as in illustration. (Fig. 6). Bending body upward at waist, raise the hips as high as possible without shifting the position of the hands or feet,



Lesson V—Fig. 6.

then bending downward at the waist, let the body sink toward the floor as far as possible without bending the arms. Continue until tired.

SIXTH LESSON

In the development of all the strong men of the world, the lifting of weights has played a prominent part. In fact, at one stage of their development, the weights became the most essential part of their training outfit. They are depended upon to furnish the unusual development of the muscles of the chest and arms, which are characteristic of the very strong man. If the athlete takes other exercises, it is for the purpose of maintaining the other parts of his body in a healthy condition.

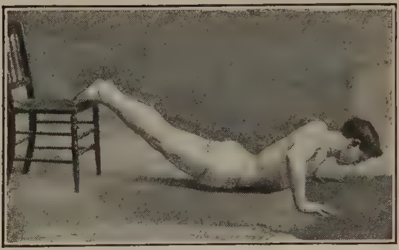
Any gymnasium director will tell you of the risks incurred by any but the most robust, who attempt to work with weights —heavy dumb-bells, etc. The object of the series of exercises given in this lesson is to supply the means for acquiring athletic development without subjecting the pupil to any risk of injury. The exercises will give as much work as could be obtained with bells as heavy as you could possibly lift, and, moreover, so divide the lifting strains that not only the muscles of the arms, shoulders, and back are hardened and strengthened, but every part of the muscular system receives an equal amount of work.

We shall stipulate no specified number of times these movements shall be taken at each exercise. The best guide is to repeat a movement until tired, gradually increasing the number as the endurance increases.

When this lesson is taken up, the pupil will find it advantageous to arrange the number of times the movements learned in preceding lessons are taken, so that they will altogether take ten to twelve minutes in the morning, and twenty to twenty-five minutes at night, and following them, practice the exercises given in this lesson until tired.

Exercise I

Place the toes on the edge of a chair, hands resting firmly on the floor on either side of the body at shoulders, as in

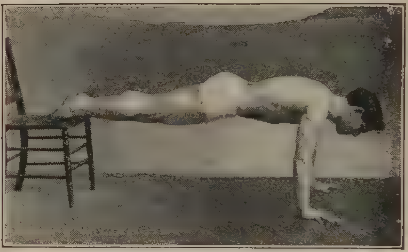


Lesson VI—Fig. 1.

Figure 1. Straighten the arms and body simultaneously, until the body assumes posture shown in Figure 2. Return to starting position, without letting the body touch the floor, and alternately raise and lower the body until tired.

Exercise 2

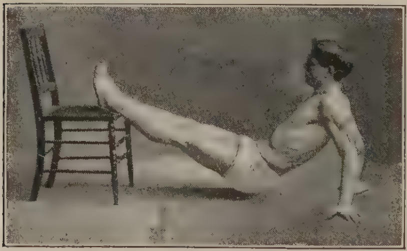
Place the heels on chair, legs straight, hands resting on floor beneath the back and as far from the chair as they can be placed, body as in Figure 3, weight supported entirely by hands and heels. Straighten body and arms simultaneously, and try to lift the body at middle as high as possible, as in Figure 4. Then lower to first position and repeat until tired.



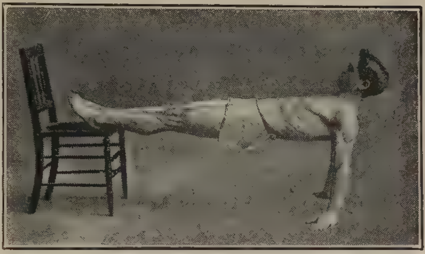
Lesson VI—Fig. 2.

Exercise 3

Take the position shown in Figure 5, the feet resting on a chair, the body with the left side turned towards the floor, the left hand braced against the floor, the right elbow pointing upward, and the right hand pressing against the right hip. Then straighten the body and left arm simultaneously until the position shown in Figure 6



Lesson VI—Fig. 3.

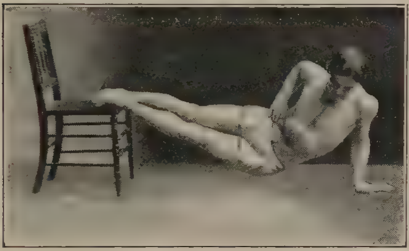


Lesson VI—Fig. 4.

is reached, returning to the first position, and repeating until tired.

Then change the position of the body, bringing the right hand on the floor and left arm up, and continue the movement on that side until tired.

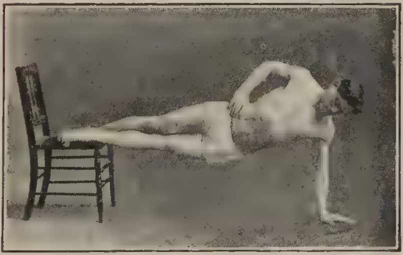
Exercise 4



Lesson VI—Fig. 5.

Recline on a couch, as in illustration (Fig. 7), or across a bed, with about half the head extending beyond the edge; grasp the back of a chair at sides about five inches from the seat, arms fully extended; then lift the chair straight over the head, and bring it down towards the feet until it touches the limbs, keeping arms straight and rigid through the movement. Return to first position, still with the arms straight, and repeat until tired.

Exercise 5

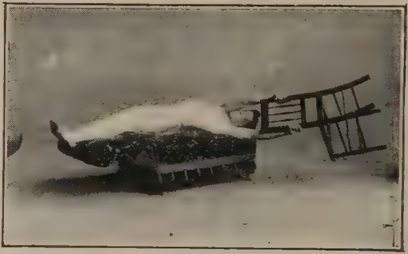


Lesson VI—Fig. 6.

Assume a reclining position on the back, as in the preceding exercise, grasp the chair as before, but turn the right arm upward until the right elbow is over the face, and the chair is tilted at an angle, as in Fig-

Lesson VI—Fig. 7.

ure 8. Then bring the chair down the left side of the body, held at arms' length, until the arms are extended downward toward the feet, and the right arm is extended diagonally across the body. Then lift the chair across to other side of the legs, bringing the left arm across the body, and swing the chair at arms' length, outward and toward the head, until the arms are extended as in illustration, but with the left arm crossing over the face. Then downward on that side and upward on the other to the starting position. Continue the movement until tired.



Lesson VI—Fig. 8.

SYSTEMATIC PHYSICAL TRAINING

Exercise with Apparatus*

General Directions

IN presenting this system of dumb-bell exercises, we wish to emphasize the necessity of carrying your physical culture into your habits of life to such an extent that you acquire the habit of involuntary right carriage and breathing. One may bathe, eat, and exercise according to rule; that is, by voluntary action, doing these things at regular times, and because you will to do them, and never attain to the greatest degree of physical or mental vigor, because as soon as the idea of doing them is absent from the mind, the wrong habits of breathing and carriage, acquired by years of custom, return, and the muscles you have been attempting to develop for use are allowed to lapse into disuse.

Strive to get into the habit of carrying the body correctly without having to think about it, and to breathe involuntarily in such a manner that the lungs are filled at every inspiration, and the blood is completely oxygenized all the time, and thus kept in the utmost degree of purity.

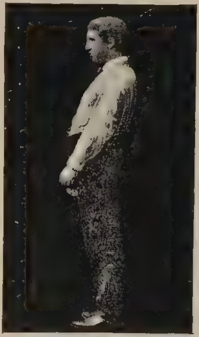


Fig. A

The illustrations presented herewith show the wrong and the right method of carrying the body. If you permit yourself to habitually slouch along as in Figure A, the beneficial effects of your systematic exercise will, to a certain extent, be nullified. On the contrary, if you strive to acquire the erect carriage shown in Figure B, you will find the functions of the body rapidly toning up. Carrying yourself thus, you will discover that deep, full respiration is natural and easy.

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* The illustrations used in this course of physical culture with apparatus were posed for us by Professor Barker, of New York, and are reproduced here with his permission.

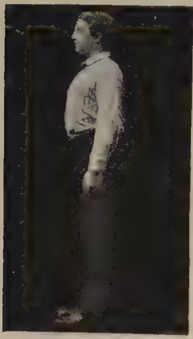


Fig. B

Breath is life, and one cannot sacrifice too much time and care to remedying any defects in the manner of breathing. A few weeks' attention to this matter will fix the proper habit upon you, and you will involuntarily walk and breathe properly.

The system of exercises presented in the following lessons is reduced to the most scientific degree of brevity. The idea in mind was to present the fewest movements possible to achieve complete and harmonious muscular development. No part of the muscular anatomy has been nelgected, and the pupil who masters the lessons thoroughly, and takes the exercises regularly, according to instructions, will not only experience benefit in improved health and physical power, but will acquire a perfection of form not to be acquired by any other method.

The instructions as to diet, bathing, etc., given at the beginning of the preceding system, should be followed faithfully in connection with these dumb-bell exercises.

A word of caution is needed as to the weight of the bells used, before we proceed. Do not go in for very heavy bells. More harm than good follows the persistent use of very heavy bells. For a healthy man, of fair physical powers, a pair of five or six pound bells will be found heavy enough. Avoid any that are heavier.

For the weak, and for women and children, bells of two or three pounds each are the most appropriate.

For the benefit of such persons as may desire to pay particular attention to the development of a certain part of the body, we give here an index of the parts the exercises used in this system are designed to develop, separating them into groups, so that the pupil, if he desires, may practice those movements which will most quickly develop the deficient part:

Exercises for the Neck

Third Lesson	Exercise 4.
Third Lesson	Exercise 5.

Exercises for the Shoulders and Arms

First Lesson	Exercises 1, 2, 3, and 4.
Second Lesson	Exercise 5.
Third Lesson	Exercise 2.
Fifth Lesson	Exercises 1 and 2.

Exercises for the Chest and Lungs

First Lesson	Exercise 6.
Second Lesson	Exercises 3 and 6.
Fourth Lesson	Exercises 1, 2, and 4.

Exercises for the Waist and Abdomen

Second Lesson	Exercise 5.
Third Lesson	Exercise 1.
Fourth Lesson	Exercises 3 and 5.

Exercises for the Pelvic Region and Legs

First Lesson	Exercise 5.
Second Lesson	Exercise 2.
Fifth Lesson	Exercises 3, 4, and 5.

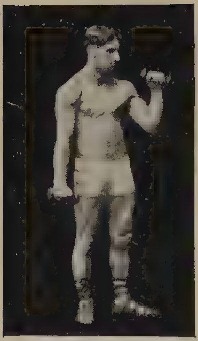
Exercise for Internal Organs

Second Lesson	Exercise 1.
Third Lesson	Exercise 3.

FIRST LESSON

Exercise 1

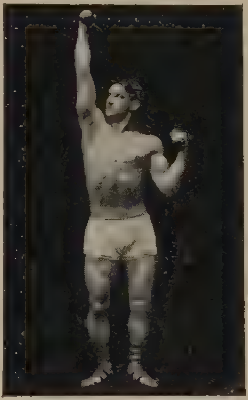
Grasp the dumb-bells firmly in the hands, stand erect, heels about four inches apart, with the arms hanging at the sides. Then bend the arm, flexing the muscles as firmly as possible, till the bell is brought above the shoulder, and the arm is bent



Lesson I—Fig. 1.

at the elbow as far as possible, and the elbow is raised until it is level with the shoulder. Return to the first position, and repeat twenty times with each arm (Fig. 1).

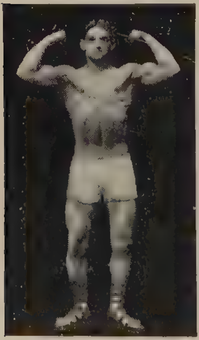
Exercise 2



Lesson I—Fig. 2.

Grasp the bells firmly, heels together, body erect. Let the arms bend at the elbows and the bells rest lightly against the shoulders; then, holding one arm in this position, thrust the other upward straight over the head, putting all the force into the movement you can (Fig. 2). Let that arm drop to the first position and thrust the other up; and so continue using the arms alternately, until the movement is repeated twenty times with each arm.

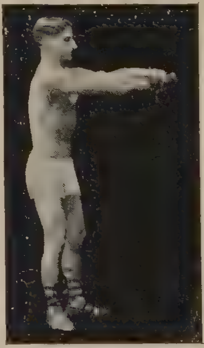
Exercise 3



Lesson I—Fig. 3.

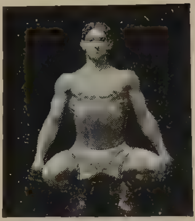
Stand erect, with heels together, grasp the bells with the arms bent as in Figure 3. Then straighten both arms horizontally simultaneously, at the sides, using all the force you can, returning quickly to the starting position. Repeat twenty times.

Exercise 4



Lesson 1—Fig. 4.

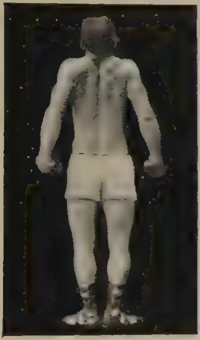
Stand with the arms extended straight in front of the body, as in Figure 4. Support the weight of the left arm on the right at the wrist, and raise both to the height of the shoulders twenty times. Then shift the left arm beneath, and repeat twenty times.



Lesson I—Fig. 5.

Exercise 5

Stand erect, with the heels about four inches apart. Grasp the bells firmly, arms straight, and held rigid at the sides. Sink down, by bending the knees, keeping the body vertical, until in the position shown in Figure 5; then rise quickly to an erect position. Repeat eight to twenty times.



Lesson I—Fig. 6.

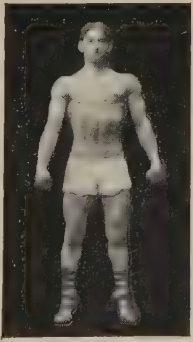
Exercise 6

Stand erect, with the heels together, the arms pointing straight down at the sides, the muscles held rigid. Hold the hands as nearly as possible in the same position, then simultaneously throw the shoulders and head as far backward as possible (Fig. 6). Return to the starting position and repeat twenty times.

SECOND LESSON

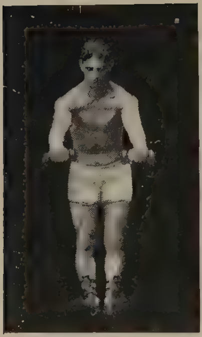
Exercise 1

Stand erect, with the heels together and the arms at the sides. Hold the muscles rigid, throw the shoulders back and rise on the toes, as in Figure 1. Then drop the heels to the floor, bend the body slightly forward, extend the arms forward at an angle of about forty-five degrees, and lift the toes from floor, as in Figure 2. From this position return to the first, and repeat twenty-five to fifty times.



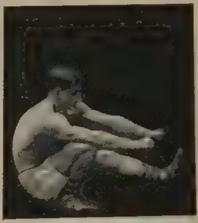
Lesson II—Fig. 1.

Exercise 2



Lesson II—Fig. 2.

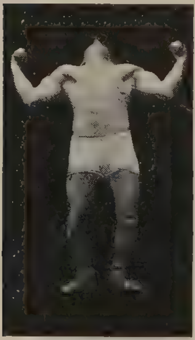
Stand erect, with the heels together, the arms pointing straight down at the sides; then straighten the left leg, lifting the left foot from the floor, and bring the arms straight out in front of the body, allowing the right knee to bend and the body to sink down as far as it is possible to recover the erect position from (Fig. 3). Repeat on each leg until tired.



Lesson II—Fig. 3.

Exercise 3

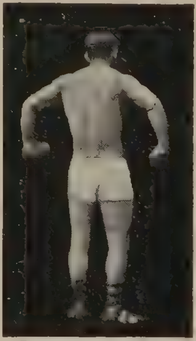
Stand erect, with the arms hanging naturally at the sides. Stoop a little forward, exhaling all the air possible from the lungs; then with great force swing the bells upward, turning the thumbs outward, bending the head and body backward, as in Figure 4, and taking a quick, deep breath as the movement is made. Repeat fifteen times.



Lesson II—Fig. 4.

Exercise 4

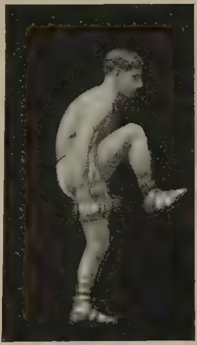
Stand erect, with the arms hanging naturally at the sides; grasp the bells firmly, flex the muscles, and draw the arms upward and backward, bending slightly forward, and endeavor to force the shoulders as far backward as possible (Fig. 5). Use all the strength you possess in making this movement Repeat twenty to thirty times.



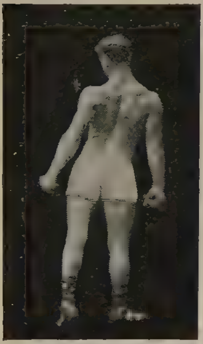
Lesson II—Fig. 5.

Exercise 5

Stand erect, with the arms at the sides, the muscles rigid. Then lift the right foot as high as possible, bending the body slightly forward, and endeavoring to make the knee touch the shoulder. Straighten, and bring the other knee up (Fig. 6). Repeat fifteen times with each leg.



Lesson II—Fig. 6.



Lesson II—Fig. 7.

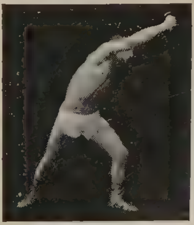
Exercise 6

Stand with the heels a few inches apart, the arms at sides, and the bells gripped firmly. Turn the body to the left and bend sideways, trying to bring the left shoulder and left hip as near together as possible (Fig. 7). Exert the muscles of the left side particularly in making this movement. Then repeat with the right side. Make the movement twelve times on each side.

THIRD LESSON

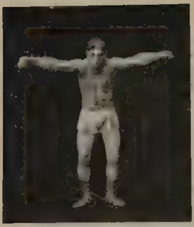
Exercise 1

Stand with the heels three or four inches apart, toes turned out, the bells gripped tightly, the arms bent at the elbows until the bells are held in front of the body at the waist. Then step out with the left foot as far as you can, and at the same time strike outward and upward with the right arm to its full length, putting all your force in the blow (Fig. 1); return to the starting position, step out with the right foot, and strike with the left hand. In making this movement the body should be turned slightly at the waist, throwing the side from which



Lesson III—Fig. 1.

the blow is delivered to the front. Strike out fifteen times with each hand.



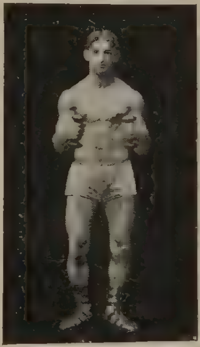
Lesson III—Fig. 2.

Exercise 2

Stand erect, with the arms at the sides, palms inward. Then raise the arms outward and upward, fully extended, keeping the backs of the hands up, and at the same time drop the head forward, and bend the body slightly at the waist (Fig. 2). Bring the hands to starting position quickly and straighten body. Repeat twenty to thirty times.

Exercise 3

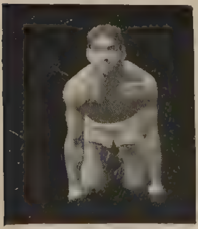
Stand erect, grip the bells tightly, with the elbows pressed close to the sides, the hands pointing straight to the front, the wrists turned in. Exert all the pressure you can against the sides, and, with muscles of the forearms flexed, bend the wrists, bringing the hands as far as possible towards the body, then straighten the wrists (Fig. 4). Continue until tired.



Lesson III—Fig. 4.

Exercise 4

Assume a kneeling position, with the arms straight and the hands gripping the bells tightly, the muscles of the arms and the body flexed, pressing the body forward with the muscles of the thighs and backward with the arms. Then bend the head as far downward, between the arms, as possible, and throw it as far backward as possible (Fig. 5). Repeat until tired.



Lesson III—Fig. 5.

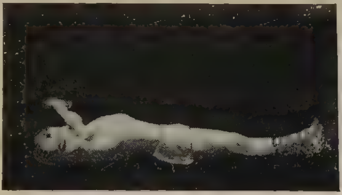
Exercise 5

Same position as in the preceding exercise, but twist the head from side to side twenty times.

FOURTH LESSON

Exercise 1

Lie on the back, the body fully extended, the muscles rigid, the bells gripped tightly, and the arms extended at right angles to the body. Move the arms upward, with the bells held clear of the floor, until they touch above the head; then move the arms downward in a half circle toward the feet until the bells are brought against the thighs; then above the head (Fig. 1). Inhale deeply while making this movement. Repeat twenty times.


Lesson IV—Fig. 1.

Exercise 2

Lesson IV—Fig. 2.

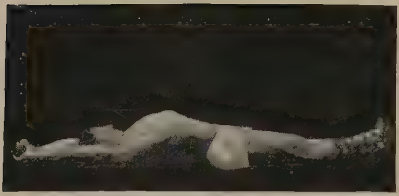
Assume the same reclining position as in the preceding exercise, with the arms extended at full length at the sides. Then raise both arms, simultaneously, until the bells are brought together above the body, as in Figure 2. Repeat twenty times.

Exercise 3

Lie on the back, with the legs fully extended, the arms bent at the elbows, and the bells gripped tightly as in Figure 3. Then raise the legs alternately, twenty times with each leg.

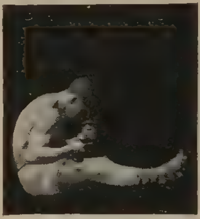
Lesson IV—Fig. 3.

Exercise 4



Lesson IV—Fig. 4.

Lie on the back with the arms extended straight over the head, as in Figure 4. Raise the arms simultaneously, at full length, and move in half circle until the bells rest upon upper part of the thighs; return in similar manner to starting position, and repeat twenty times.



Lesson IV—Fig. 5.

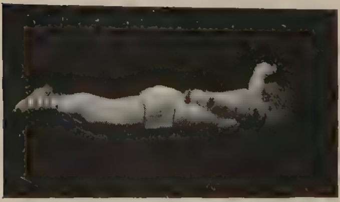
Exercise 5

Lie on the back, the arms bent at the elbows and the bells held above the chest at either side; rise to position shown in Figure 5, and return to the starting position. Repeat fifteen to twenty-five times.

FIFTH LESSON

Exercise 1

Lie at full length on the stomach, with the arms extended to full length at right angles to the body, as in Figure 1. Then raise the arms from the floor backward as far as possible. Repeat fifteen to twenty-five times.



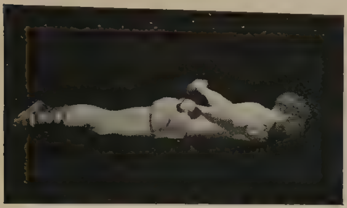
Lesson V—Fig. 1.

Exercise 2

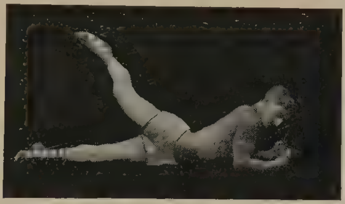
Lie on the stomach, with the arms extended parallel with the body. Raise the hands as far as possible from the floor, as in Figure 2. Repeat twenty times.

Exercise 3

Lie on the stomach, with the weight of the upper part of the body resting on the elbows, as in Figure 3. Raise the legs alternately as high as possible. Make twenty-five movements with each leg.



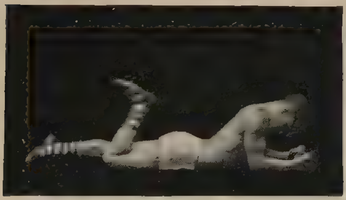
Lesson V—Fig. 2.



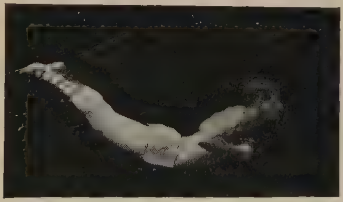
Lesson V—Fig. 3.

Exercise 4

Lie on the stomach, as in Figure 4, the muscles held rigid, forehead touching the bells; then bend the knee, and throw the leg as far upward and backward toward the body as possible, at the same time raising the head and shoulders as far as possible without lifting the elbows from the floor; use the legs alternately, and make the movement from thirty to fifty times.



Lesson V—Fig. 4.



Lesson V—Fig. 5.

Exercise 5

Lie on the stomach, at full length, with the arms bent at the elbows, and the bells held close to the sides; raise the chest and legs from the floor simultaneously, as far as possible (Fig. 5). Repeat fifteen to twenty times.

SYSTEMATIC PHYSICAL TRAINING

Introduction

THE promulgation and acceptance of the theory that systematic exercise produces beneficial results in all living beings, has brought more apparent benefit to womankind than any of the innovations of the century. It used to be considered an impossibility for women to compete in the intellectual drill of modern university education with men, because, under the unwonted strain, so many broke down in health, and, consequently, in mental vigor. The demonstration of the theorem, that a sound body and a sound mind are co-existent, and the introduction of those habits and exercises which contribute to physical strength, solved the problem. The college woman of to-day, who is a golfer, a walker, and a gymnasium worker, represents, as a class, one of the healthiest the sex presents.

In modern civilized life, woman is a much more artificial animal than man. She has, in fact, in a great many instances, become entirely exotic, or of indoor habits. The result is shown by the vast percentage of invalid women to be found in every community.

Already the results of fugitive efforts to induce women to resort to systematic physical training to give them the strength, health, and beauty that should be their heritage, are bearing fruit; and the stunning athletic girl, with her fine carriage, beautiful complexion, and enviable health, has appeared in every community. Unfortunately, she is oftener envied than emulated. If women would only learn that good circulation, good digestion, and muscular vigor are the chief aids to beauty, as well as to health, there would soon be comparatively few weak, wan, and sickly women in our country.

Perhaps one of the most powerful factors in deterring the majority of women from taking up some form of regular exercise—of body-building physical culture—is the erroneous idea that it would require sacrifices of time impossible for many to make because of their occupations, and entail hardships in the way of long and exhausting training and adherence to dietetic rules entirely foreign to what have been the habits of the individual.

This idea should be banished at once. Sensible, health-giving physical culture means none of these things. It merely means a hygienic method of life and sufficient attention paid to the muscular organization in the way of carefully selected, systematic exercise, to insure keeping the tissues in a wholesome state, and supplying them with a proper amount of blood.

The women who have learned this are far in advance of their sisters, not only in the matter of health, but in their ability to retain their good looks and youthful appearance.

Not so very long ago women had to "settle down" as patiently as they could to the belief that they were doomed to wear the signs of premature old age. Their lives were generally all after one pattern. Whether they married or remained single they began to grow fat at thirty; at forty they were stout; at fifty they were burdensome to themselves, and long before sixty they were hopelessly old. Those women who have learned the benefits of keeping the muscular part of their being in a condition of vigorous activity have proved how senseless such a programme is.

A woman who takes anything like proper care of her body is still girlish at thirty; at forty her charm is little impaired, and at fifty she is magnetic, attractive, and as keenly imbued with the delights of living as when she emerged from her teens.

If one could present a list of grandmothers of the present time who are still beautiful, attractive, and sought-after women, it would astonish the community.

These women are not different from the grandmothers who preceded them in any inherited powers; they have merely followed such a course of life as extends their period of vigor and physical charm a little nearer what should be its normal term.

Physical education, like intellectual education, is something that should be kept at through life. Those who drop all intellectual exercises upon leaving school or college, rapidly deteriorate intellectually; and such as leave the health-giving exercises which they naturally indulged in as children out of their scheme of life upon reaching maturity, as quickly become physically degenerate—weak, easy prey for disease: and invariably, in the case of a woman, she quickly loses her beauty.

Because physical education is something that must be kept up all the time, it does not follow that it is a hard, grinding, monotonous affair, to be avoided even at the sacrifice of a few years of one's life. The right sort of physical training does not require much of one's time. It only requires the determination to undertake it, and then the formation of habits which will in a short time become almost second nature; which will not take up much time, and certainly not prove irksome.

Women and men are so different in physical attributes that there must of necessity be some difference in the methods adopted for producing the highest degree of physical and mental health in members of the two sexes. To a certain extent a woman may participate in all the exercises laid down for the development of a man. In the golden days of Greece, women contested with men in the public games, and often gave splendid exhibitions of courage, endurance, and dexterity, and there have been many examples of women who were physically as powerful as men. But in dealing with our modern women, the physical culturist must recognize certain differences and limitations and provide for them. With the exception of some of the more strenuous exercises included in the preceding systems, any woman of ordinary strength may take them with benefit. This applies especially to such exercises in the dumb-bell system as are intended for the development of the arms, chest, and shoulders. These and the door exercises in the preceding system will be found especially effective for the development of plumper bodies, and firmer, more symmetrical busts.

For the woman, however, whose aim is to promote better circulation, to increase her suppleness, and add grace and charm to her personality, while contributing to her general health, the following system of simple exercises is presented. They are such as any woman can easily perform without more than a few moments' study of the illustrations and accompanying directions. They will suffice to stimulate all parts of the muscular organization, and, if followed faithfully, in a very short time will assuredly produce astonishing results in improved appearance as well as in improved health.

It is necessary to understand a few general principles before beginning the exercises, and it is vastly important that any woman who takes up any system of exercises should firmly fix her mind on the object to be achieved. Determine to do what you attempt for a definite purpose. Keep this idea always in view, and when exercising make the movements with a will behind them. Do not exercise with the idea dominant that you are merely following the movements suggested by some one else. Keep the thought of accomplishing something always in mind. This is of the utmost importance, and if paid heed to, the pupil will be amply repaid in the quick results obtained.

Some attention should be given to the matter of hygienic clothing. You should not habitually squeeze any set of muscles entirely out of shape by any form of tight lacing, making it impossible for the normal blood supply to reach them, and then expect to remedy defects by exercise. If stays are worn they should be made to conform to the figure; no undue constriction should be applied, and they should not be worn at home, or at any time when comfort can be considered before appearance. When in the house a costume that is freely loose and permits the circulation of the air to all parts of the skin should be worn.

The employment of ordinary intelligence in the matter of eating is also necessary. No body habitually poisoned by a heterogeneous collection of candies, pastries, pickles, etc., can, by any method of physical culture, be made strong and beautiful. A woman's body has the same sort of tissue cells as a man's. These cells demand the same sort of nutrition, and this must be supplied in the blood, through the food which is taken into the stomach. Plain, nutritious food is best, and a diet composed more largely of vegetables than meats will be found the most effective coöperating agent in producing what you desire. The use of coffee, tea, candies, pastries, and all forms of stimulants should be avoided. At your ordinary breakfast hour, a cup of cocoa, fruit, and a little toast should suffice. Eat your principal meal at noon. All the vegetables you desire, some whole grain bread, a little soup if you wish it, cocoa or milk, eggs, roast fowl, or beef, and a plain pudding for dessert, should furnish the articles for your menu. Supper should not be eaten later than seven o'clock, and should consist of vegetables, bread, butter, and stewed fruits.

Every woman should make it a point to take a walk of not less than a mile each day in the open air.

Exercise should be taken immediately after rising, and just before retiring, and with as little hampering clothing as the surroundings will permit. After exercise the skin should be brushed briskly with a flesh brush, and sponged off with tepid water.

In the following pages, when reference is made to "flexed" muscles, the pupil should understand that this is a condition of partial contraction, as much as can be produced by merely fixing the mind on it and forcing the muscular tissues to harden. To flex the muscles of the arms and shoulders, close the hands tightly and imagine you are holding a rather difficult weight. If standing, rise to full height, and exert such effort as would be required in sustaining a heavy weight.

After going through any particular exercise the required number of times, as specified in the following instructions, the muscles should be allowed to relax completely, or become soft and flaccid. Unless this is practiced quite as carefully as the movements themselves, the very best results cannot be obtained. The contractions produced in muscular tissue by using them, tend to force out the blood and other liquids from the fine capillary vessels which lie all through the system; and when the tissue is relaxed it permits a new supply of fresh, nutritious blood to flow in, bringing new life and energy to the cells of the muscular system.

SYSTEMATIC PHYSICAL TRAINING

Special Exercises for Women

WHEN you meet a woman her carriage is the first characteristic that impresses you. If it is upright, buoyant, and graceful, the chances are ten to one she will impress you as being a pretty woman, whether her face is beautiful or not. Nine-tenths of the reigning beauties of to-day owe their elevation more to proper and graceful carriage than to mere beauty of features.

Good carriage will to a large extent hide any defect of form. The women of the stage, credited with being the possessors of Venus-like forms, owe their position in popular estimation to the great attention they pay to carriage. If any woman can stand properly, hold her body properly poised, and walk gracefully, she will certainly be set down as a pretty and well-formed woman, wherever she goes.

Proper carriage, the physiologist will tell you, is impossible without proper muscular development. And so it is; yet, a long stride has been taken when a woman decides to make an effort to stand and walk naturally. When the attempt is first made, if improper methods have been habitually employed, it will quickly tire you; but persistence, and a brief period devoted to practice of the movements shown herewith, will make it easy.

Figure 1 shows the right way to stand. The weight should be evenly distributed on the ball and heel of the foot; the limbs should be held straight, and slightly—very slightly—inclined forward from the perpendicular; the abdomen should be held in; the bust should form a graceful curve from waist to neck; the spine should be perpendicular; the shoulders

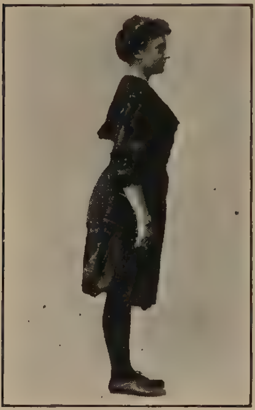


Fig. 1

should be thrown back until the space between them is flat and straight, and the head should be held firmly erect—not allowed to drop forward, or incline to either side. In this position the internal organs are permitted free play, and no difficulty is encountered in breathing deeply. Assume this position, hold it for a few moments, and inhale several slow, deep breaths before commencing your exercises every day, and it will quickly become easy, and eventually habitual.

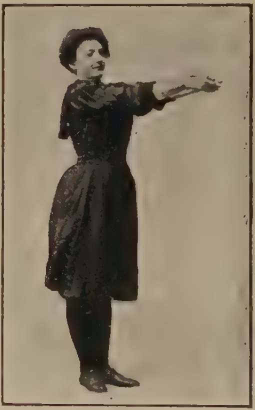


Fig. 2

Exercise 1

Stand erect, arms extended straight before the body, as in Figure 2; hands clasped, muscles flexed. Then swing the arms apart and backward, in a horizontal plane, to position shown in Figure 3. Return to first position, and repeat eight to twelve times. Make the movements quickly.

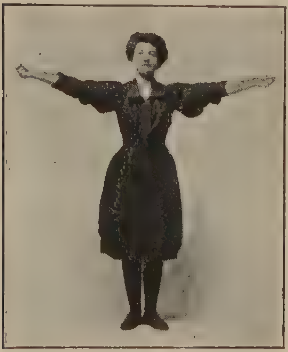


Fig. 3

Exercise 2

Place the palms of the hands together over the head, arms extended; throw arms backward as far as possible, to position shown in Figure 4, then swing them forward and downward, bending body at the waist, but hold knees rigid till you touch the floor (Fig. 5), or come as near to it as you can. Swing arms back over the head, and repeat ten to thirty times. This exercise may be varied by standing with the feet about fourteen inches apart, and swinging the arms as far between the legs as possible on the downward swing.

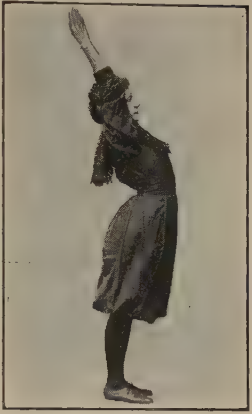


Fig. 4

Exercise 3

Stand erect, hands clinched, arms straight and inclined downward and backward as in Figure 6; muscles held firmly flexed, chest thrown forward. Then bring the arms forward and cross them in front of the body, alternating them above and beneath, and crossing them as far as possible without bending the elbows, as in Figure 7. Return to first position, and repeat twenty to thirty times.

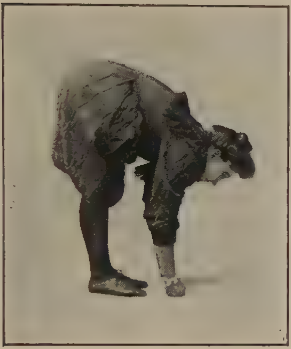


Fig. 5

Exercise 4

With the body in the position shown in Figure 6, slowly straighten the arms and raise them until they are brought as high as possible, turning the backs of the hands to the front, as the movement is made. Reverse this movement, return to starting position, and repeat ten times.

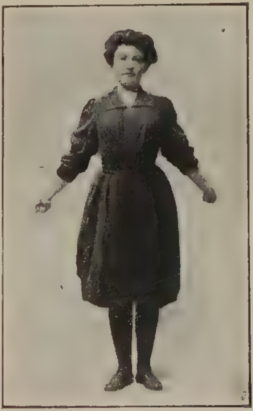


Fig. 6

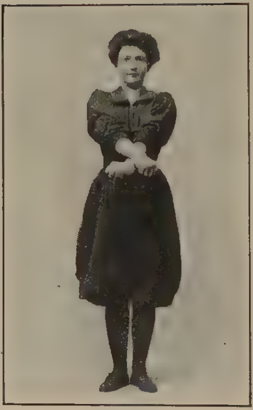


Fig. 7

Exercise 5

Stand erect, arms bent at elbows, hands clinched and resting against shoulders, as in Figure 8. Then, thrust up as far as possible above the head with each arm alternately (Fig. 9), as if you were striking at some object slightly out of your reach. Repeat twelve to thirty times with each arm.

Exercise 6

Stand as in Figure 8. Thrust up the arms simultaneously to their full length at either side, as in Figure 10. Return to starting position and repeat fifteen to twenty times.

This and the preceding exercise may be varied by striking straight out in front with the arms, instead of upward.

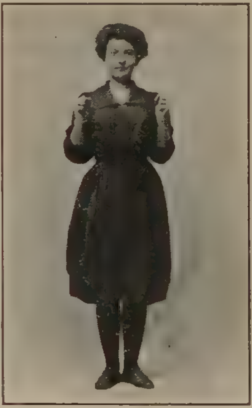


Fig. 8

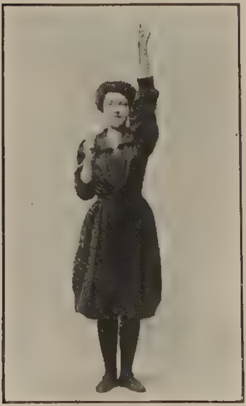


Fig. 9

Exercise 7

Stand as shown in Figure 10, with the arms extended horizontally, and the hands clinched; then bend the body to the right without changing relative position of the arms, until the position shown in Figure 12 is reached. From this position return to first position and bend in opposite direction until the left arm points down and the right one up. Repeat eight to twenty times.

Exercise 8

Stand with arms extended as in Figure 11. Turn the body at waist as if on a pivot until right arm points in straight line with the toes, then swing left arm to the front and right to the rear. Make this movement fifteen to twenty times.

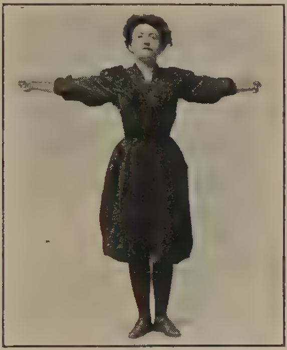


Fig. 10

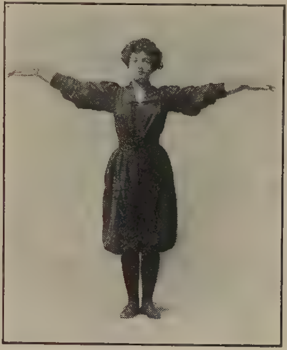


Fig. 11

Exercise 9

Stand as in Figure 13, with the shoulders held as far back as possible, muscles firmly flexed. Turn the arms slowly inward, pulling the shoulders as high as possible until position shown in Figure 14 is reached. Relax and begin over again. Repeat six to ten times. Take in a full breath before beginning the movement and exhale slowly as the arms are brought forward to final position.

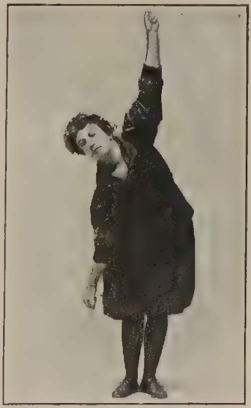


Fig. 12

Exercise 10

Stand erect, arms at sides, hands clinched; step forward with right foot and strike forward and slightly upward with right hand, swinging the left arm backward as far as it will go, as in Figure 15. Resume first position and strike out with left arm, etc. Repeat ten to twenty times.

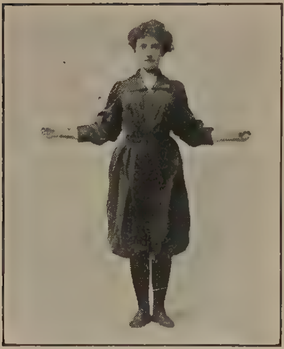


Fig. 13

Exercise 11

Stand erect, arms hanging at sides, hands clinched; kick out with the right foot until foot and leg are as nearly as possible at right angles to the rest of the body, as in Figure 16. Bring right foot firmly back to the floor, and kick out with left. Repeat twelve to twenty times with each leg.

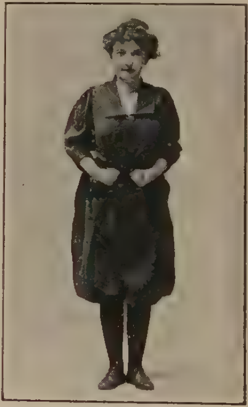


Fig. 14

Exercise 12

Stand erect, arms at sides, and kick backward as far as possible, throwing the head as far backward as possible as each kick is made. Use the legs alternately. Repeat eight to twelve times with each foot.

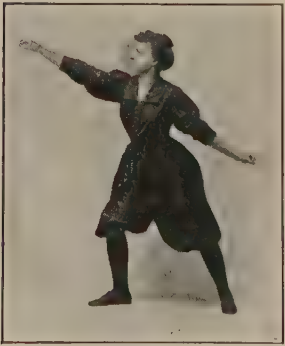


Fig. 15

Exercise 13

Assume a reclining position, as shown in Figure 17. Hands clinched. Raise the head and trunk slowly until a sitting position is reached, bending the arms at elbows and bringing clinched hands firmly against the chest as in Figure 18 Return to first position, and repeat until tired.

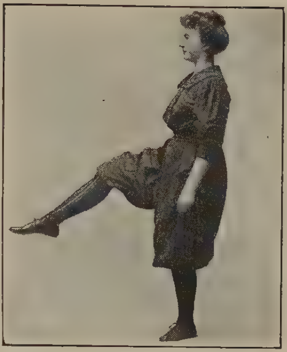


Fig. 16

Exercise 14

Assume the position shown in Figure 17. Raise the limbs simultaneously to the perpendicular position, as in Figure 19. Let the legs sink slowly to starting position, and continue until tired.

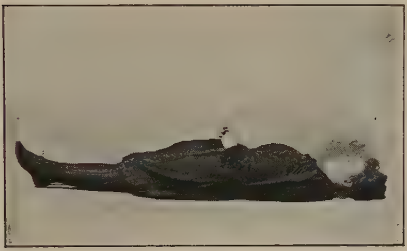


Fig. 17

Exercise 15

From the position shown in Figure 17 raise each leg alternately as shown in Figure 20—twenty to thirty times.

Exercise 16

From the reclining position shown in Figure 17 lift one leg at a time until the hands can be clasped back of knee, then pull the thigh as firmly against the abdomen as possible and release, letting the leg drop back to starting position. Repeat the movement

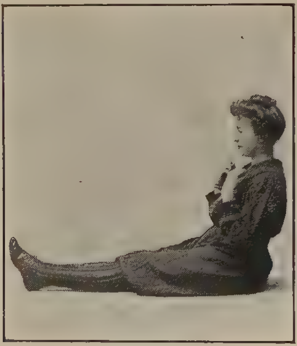


Fig. 18

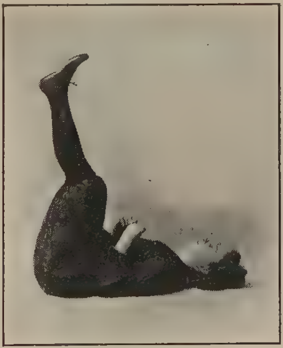


Fig. 19

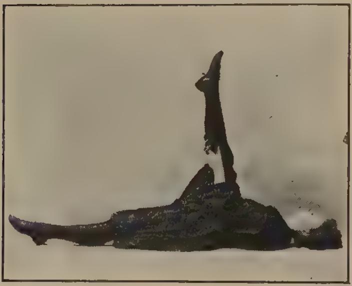


Fig. 20

ten to fifteen times with each leg, using them alternately.

Exercises 14, 15, and 16 are recommended to women suffering from various forms of female weakness. In such cases, the exercises should be taken on a lounge or platform, where the feet can be elevated ten to twelve inches higher than the head.

Exercise 17

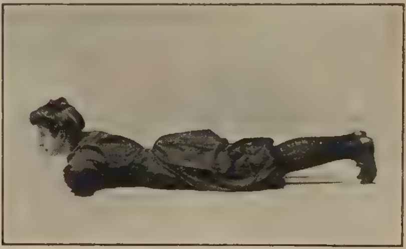


FIG. 12

Assume the position shown in Figure 21, with the body resting easily on the floor, toes touching floor, hands placed firmly on floor directly under each shoulder, finger tips touching, arms at right angles to the body. Straighten arms and legs simultaneously until body is lifted clear of the floor, and supported on the hands and toes only, as in Figure 22. Repeat until tired. This is a trying movement, and if you find it too strenuous at the start, begin by lifting the upper part of the body only, allowing it to bend at waist, and gradually accustom yourself to the movement.

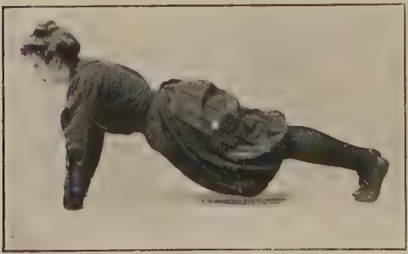


Fig. 22

Exercise 18

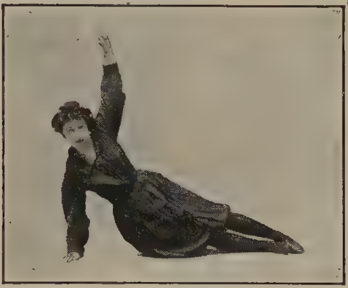


Fig. 23

Assume the position shown in Figure 22. Lift the left hand from the floor and throw the left arm upward and backward, turning the body simultaneously until the position shown in Figure 23 is reached. Return to first position and elevate the right arm. Repeat until ten movements are made with each arm.

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